

Want to optimize those 10,000 (or fewer) steps? Walk faster, sit less

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Steps at a brisk pace are most valuable. Credit: Oregon State University

That popular daily target of 10,000 steps is a worthwhile goal, but a new study at Oregon State University suggests that if you find that unattainable, don't despair - a smaller number, especially at moderate or

greater intensity, can lead to health benefits too.

It's especially helpful if 3,000 of the [steps](#) come at a brisk pace, and limiting sedentary time also plays a role in healthy readings for cholesterol and other risk factors.

The average American takes between 5,000 and 7,000 steps per day, researchers say.

"Some physical activity is better than none, and typically more is better than less," said John Schuna Jr., assistant professor of kinesiology in OSU's College of Public Health and Human Sciences.

"When it comes to steps, more is better than fewer, and steps at higher cadences for a significant amount of time are beneficial. A good target for healthy adults is 150 minutes per week spent at 100 or more steps per minute. And in terms of time spent sedentary, less is better - you want to spend as little time not moving as possible within reason."

Schuna, lead author Catrine Tudor-Locke of the University of Massachusetts and six other researchers analyzed data from 3,388 participants age 20 and older in a National Health and Nutrition Examination Survey.

Their findings were recently published in the journal *Medicine & Science in Sports & Exercise*.

The research builds on earlier studies, many of which relied on self-reported estimates of activity levels, which tend to run high, or accelerometer data using proprietary output measures (e.g., activity counts/minute), and also failed to take cadence - steps per minute - into account. A cadence of 100 steps per minute or greater is widely accepted as the threshold for moderate-intensity activity in adults.

In addition to minute-by-minute step data, the researchers looked at relationships between step-defined physical activity and various cardiometabolic risk factors for the survey participants - such as waist circumference, blood pressure, fasting glucose, insulin, and cholesterol levels, as well as body mass index.

Among male participants, only the highest quintile - the top one-fifth - had a median of more than 10,000 steps per day, checking in at 12,334. Among women, the top quintile's median was 9,824.

Beyond just total step counts, the research looked at daily "peak 30-minute cadence" - the average number of steps in a participant's most vigorous 30 minutes, which weren't necessarily consecutive minutes. To measure sedentary time, researchers used the percentage of accelerometer time per day that showed no step-based movement.

Among all survey participants, only the top quintile had a median peak cadence - 96 steps per minute - that was in line with accepted physical activity guidelines of 30 minutes a day at 100 steps per minute.

Nevertheless, analysis across all quintiles showed a strong relationship between higher cadences - walking more briskly as opposed to less briskly - and favorable numbers in the cardiometabolic risk categories.

The same held true for number of steps, whether above or below the 10,000-step threshold. And higher percentages of sedentary time were linked to less-favorable values in several risk factors.

While FitBit, Garmin and other fitness trackers might be responsible for the current 10,000-step fixation, Schuna notes that the magic number's roots trace to 1960s Japan. From a fitness craze inspired by the 1964 Tokyo Olympics sprang the first commercial pedometer, the manpo-kei. In Japanese, manpo-kei literally means "10,000 steps meter."

"One of the questions has always been, what if one person with 10,000 steps per day accumulates nearly all of them in a two-hour time block, and another stretches them over 15 hours - does it matter in terms of health effects?" Schuna said.

"This is a big debate in the field, with a couple of intertwined questions. Current evidence does suggest that moderate to vigorous activity and sedentary time have a certain amount of independence from each other in terms of health effects. But if you're getting two or three hours of moderate to vigorous activity every day, even if you're relatively sedentary the rest of the time, it's hard to imagine the sedentary time would completely ameliorate or wipe out the [health benefits](#) associated with that level of activity."

A person who averages 10,000 or more steps/day typically accumulates at least 150 minutes a week of moderate to vigorous activity, Schuna said.

"Now there is an additional caveat regarding the manner in which physical activity is accumulated to meet current physical activity guidelines, which states that aerobic activity should be accumulated in bouts of at least 10 minutes in duration.," he said. "If we take this into consideration, it becomes more difficult to determine whether or not someone is meeting the physical activity guidelines using step counts alone. That aside, averaging 10,000 or more steps/day puts you in the top 15 percent of adults in terms of step-defined physical activity."

Schuna envisions a future in which wearable fitness trackers will feature apps that make minute-by-minute data available to the user, as research-grade accelerometers now do to scientists.

"That's along this paradigm of personalized medicine," he said. "In the future, everyone will have his or her genome sequenced, and from that

we'll be looking for specific markers that predispose people to higher risks for certain conditions. The physical activity and sleep data we collect from wearable devices will be used to track compliance to individualized behavior prescriptions while attempting to optimize each individual's health."

More information: Catrine Tudor-Locke et al, Step-based Physical Activity Metrics and Cardiometabolic Risk, *Medicine & Science in Sports & Exercise* (2016). [DOI: 10.1249/MSS.0000000000001100](https://doi.org/10.1249/MSS.0000000000001100)

Provided by Oregon State University

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