

## The 4-Minute Workout

By **GRETCHEN REYNOLDS**, The New York Times, June 19, 2013

Thanks to an ingratiating new study, we may finally be closer to answering that ever-popular question regarding our health and fitness: How little exercise can I get away with? The answer, it seems, may be four minutes.

For the study, which was published last month in the journal PLoS One, researchers from the Norwegian University of Science and Technology in Trondheim, Norway, and other institutions attempted to delineate the minimum amount of exercise required to develop appreciable endurance and health gains. They began by reconsidering their own past work, which had examined the effects of a relatively large dose of high-intensity intervals on various measures of health and fitness.

For those unfamiliar with the term, high-intensity intervals are just that: bursts of strenuous exercise lasting anywhere from 30 seconds to several minutes, interspersed with periods of rest. In recent years, a wealth of studies have established that sessions of high-intensity exercises can be as potent, physiologically, as much longer bouts of sustained endurance exercise.

In a representative study from 2010, for instance, Canadian researchers showed that 10 one-minute intervals — essentially, 10 minutes of strenuous exercise braided with one-minute rest periods between — led to the same changes within muscle cells as about 90 minutes of moderate bike riding.

Similarly, the Norwegian scientists for some years have been studying the effects of intense intervals lasting for four minutes, performed at about 90 percent of each volunteer's maximum heart rate and repeated four times, with a three-minute rest between each interval. The total meaningful exercise time in these sessions, then, is 16 minutes. Which, the researchers thought, might just be too much.

“One of the main reasons people give” for not exercising is that they don't have time, says Arnt Erik Tjonna, a postdoctoral fellow at the Norwegian University of Science and Technology, who led the study.

So he and his colleagues decided to slim down the regimen and determine whether a single, strenuous four-minute workout would effectively improve health and fitness.

To do so, they gathered 26 overweight and sedentary but otherwise healthy middle-aged men, determined their baseline endurance and cardiovascular and metabolic health, and randomly assigned them to one of two groups.

Half began a supervised exercise program that reiterated the Norwegian researchers' former routine. After briefly warming up, these volunteers ran on a treadmill at 90 percent of their maximal heart rate — a tiring pace, says Dr. Tjonna, at which “you cannot talk in full sentences, but can use single words” — for four four-minute intervals, with three minutes of slow walking between, followed by a brief cool-down. The entire

session was repeated three times a week for 10 weeks.

The second group, however, completed only one four-minute strenuous run. They, too, exercised three times a week for 10 weeks.

At the end of the program, the men had increased their maximal oxygen uptake, or endurance capacity, by an average of 10 percent or more, with no significant differences in the gains between the two groups.

Metabolic and cardiovascular health likewise had improved in both groups, with almost all of the men now displaying better blood sugar control and blood pressure profiles, whether they had exercised vigorously for 16 minutes per session, or four minutes per session, and despite the fact that few of the men had lost much body fat.

“This is not a weight-loss program,” Dr. Tjonna says. It is, instead, he says, “a suggestion for how people can make a kick-start for better fitness,” or maintain fitness already gained, when other obligations press on your time.

The results, Dr. Tjonna says, persuasively suggest that “getting in shape does not demand a big effort” in terms of time.

That finding, though, inevitably raises the question of whether the bar could drop even lower. Could, for instance, a mere two minutes of strenuous training effectively improve health and fitness?

Dr. Tjonna, the killjoy, doubts it. There are other groups of scientists looking at even shorter bouts of exercise, he says, “but it seems like they don’t get the same results regarding the maximal oxygen uptake” as the four-minute sessions used in his experiment. Since improved maximal oxygen uptake can reliably indicate better overall cardiovascular health, he suspects that “we need a certain length of the interval to trigger” such health and fitness benefits.

Thankfully, for those worried that a trip to the gym is an inefficient means of completing four minutes of exercise, the workout can effectively be practiced anywhere, Dr. Tjonna says. Sprint uphill for four minutes or race up multiple flights of steps. Bicycle, swim or even walk briskly, as long as you raise your heart rate sufficiently for four minutes. (Obviously, consult your doctor first if you haven’t been active in the past.)

“Everyone, we think,” Dr. Tjonna says, “has time for this kind of exercise three times a week.”

Special thanks to the [Reduced Shakespeare Company](#) and [Christopher McDougall](#) for their contributions to the Well 4-Minute Workout playlist.