



**Just 12 Minutes Of Intense Exercise  
Is Enough To Change Biomarkers  
In Your Blood**

Short bursts of exercise have more of an impact on our bodies than you might think: a new study shows that just 12 minutes of intense activity is enough to significantly change the biomarkers of metabolic health in people's blood.

Researchers analysed the reactions of 411 middle-aged men and women to 12 minutes of "vigorous" exercise, finding that the exercise had an effect on more than 80 percent of circulating metabolites in the participants' blood. These metabolites can act as indicators of cardiometabolic, cardiovascular, and long-term health, suggesting that even a short hit of activity is enough to benefit some of the body's key biological processes.

"Much is known about the effects of exercise on cardiac, vascular and inflammatory systems of the body, but our study provides a comprehensive look at the metabolic impact of exercise by linking specific metabolic pathways to exercise response variables and long-term health outcomes," says Gregory Lewis, a specialist in heart failure and cardiac transplantation, from MGH.

"What was striking to us was the effects a brief bout of exercise can have on the circulating levels of metabolites that govern such key bodily functions as insulin resistance, oxidative stress, vascular reactivity, inflammation and longevity."

One example mentioned by the researchers is the metabolite glutamate. It's linked to heart disease, diabetes, and a shorter lifespan, and it fell by 29 percent on average.

Meanwhile the metabolite DMGV (dimethylguanidino valeric acid), which is associated with an increased risk of diabetes and liver disease, dropped by 18 percent.

The researchers reported some variations across the sex and body mass index of the participants: there were signs that obesity can limit some of the benefits of high intensity exercise, for example.

A total of 588 metabolites were tracked and measured by the researchers.

"Intriguingly, our study found that different metabolites tracked with different physiologic responses to exercise, and might therefore provide unique signatures in the bloodstream that reveal if a person is physically fit, much the way current blood tests determine how well the kidney and liver are functioning," says cardiologist Matthew Naylor, from MGH

Data for the new analysis was pulled from the Framingham Heart Study, a long-running research project that now covers three generations of people. As records for the study go back to 1948, researchers can see how metabolic signatures affect long-term health.

There's now a growing collection of studies showing that even a little bit of exercise can go a long way: even if you only get moving for an hour a week, the body can feel the benefit.

Getting moving and staying active can help to fight cancer, boost your memory, and help you lose weight. "We're starting to better understand the molecular underpinnings of how exercise affects the body and use that knowledge to understand the metabolic architecture around exercise response patterns," says cardiologist Ravi Shah, from MGH.

"This approach has the potential to target people who have high blood pressure or many other metabolic risk factors in response to exercise, and set them on a healthier trajectory early in their lives."

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