

Feeling winded after your workout? Long COVID may claim another symptom

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We've heard about brain fog, fatigue and headache as symptoms of long COVID. Now a new study points to another persistent effect of SARS-CoV-2, identified months after infection: reduced exercise capacity.

In their study in *JAMA Network Open* on Oct. 12, 2022, researchers from UC San Francisco and Zuckerberg San Francisco General Hospital identified 38 previous studies that tracked the exercise performances of more than 2,000 participants who previously had COVID-19, including those with probable long COVID. The researchers narrowed their analysis to nine studies in which the exercise performances of 359 participants who had recovered from the virus was compared to that of 464 participants who had symptoms consistent with long COVID.

The average age of the participants in these nine studies ranged from 39 to 56, and the average body mass index ranged from 26 (overweight) to 30 (obese).

The findings suggest that the long COVID cohort in this subgroup may have reduced oxygen extraction in the muscles, irregular breathing patterns, and a lesser ability to increase heart rate during exercise to match cardiac output. In addition, there was evidence of deconditioning, which occurs to some extent after most physical illnesses that result in inactivity, the researchers noted. Importantly, not all the findings could be attributed to deconditioning.

Exercise tests were conducted at least three months following SARS-CoV-2 infection and involved cardiopulmonary exercise testing (CPET), in which oxygen and [carbon dioxide](#) were measured, together with other indices of heart and lung function, while the participant used a treadmill or stationary bike.

Doubles tennis, lap swims may be too strenuous for those with long COVID

In comparing exercise tolerance, the researchers found the long COVID group's peak rate of oxygen was 4.9 ml/kg/min lower than the recovered

group. According to first author Matthew S. Durstenfeld, MD, MAS, of the UCSF Department of Medicine and of the Division of Cardiology at Zuckerberg San Francisco General Hospital, this difference is equivalent to 1.4 metabolic equivalent of tasks (METs), a measure of energy consumed during physical activities. "This decline in oxygen peak rate would roughly translate to a 40-year-old woman with an expected exercise capacity of 9.5 METs, dropping to 8.1 METs, the approximate expected exercise capacity for a 50-year-old woman," he said.

Another way of looking at it, Durstenfeld said, is that a doubles tennis player might need to transition to playing golf with a cart or stretching exercises, and those who swim laps may find that low-impact aerobics is a better match. "But it's important to note that this is an average," he cautioned. "Some individuals experience a profound decrease in energy capacity and many others experience no decrease." In their analysis of the studies, the researchers stated that while they found "modest but consistent" evidence suggesting exercise capacity is reduced in participants with long COVID, there was "a low confidence in the magnitude of effect." They attributed this to small study sizes, oversampling of hospitalized participants, as well as those with acute symptoms who had been referred to long COVID clinics and for CPETs, and variability in definitions of long COVID and CPET modalities. None of the studies had performed pre-infection CPETs for comparison use.

"Further research should include long-term observational assessments to understand the trajectory of [exercise capacity](#)," said senior author Priscilla Y. Hsue, MD, of the UCSF Department of Medicine and of the Division of Cardiology at Zuckerberg San Francisco General Hospital. "Trials of potential therapies are urgently needed, including studies of rehabilitation to address deconditioning, as well as further investigation into dysfunctional breathing, damage to the nerves that control automatic body functions and the inability to increase the [heart rate](#) adequately

during [exercise](#)."

More information: *JAMA Network Open* (2022).
jamanetwork.com/journals/jaman...tworkopen.2022.36057

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