“Replicated blood-based biomarkers for myalgic encephalomyelitis not explicable by inactivity”

This study found several blood markers that linked to the illness. These links were direct, meaning they aren't simply the result of being inactive. The researchers only found one weak indirect link, suggesting that the blood changes aren't just secondary effects of lifestyle or other conditions but due to the disease itself. Overall, the findings support that ME has a biological basis that can't be explained away by inactivity alone.

https://www.embopress.org/doi/full/10.1038/s44321-025-00258-8?utm_source=rct_congratemailt&utm_medium=email&utm_campaign=oa_20250620&utm_content=10.1038%2Fs44321-025-00258-8

Skeletal muscle properties in long COVID and ME/CFS differ from those induced by bed rest

“Here, we compared whole-body exercise responses and skeletal muscle adaptations after strict 60-day bed rest in healthy people with those in patients with long COVID and ME/CFS, and healthy age- and sex-matched controls.

Bed rest altered the respiratory and cardiovascular responses to (sub)maximal exercise, while patients demonstrated respiratory alterations only at submaximal exercise. Bed rest caused muscle atrophy, and the reduced oxidative phosphorylation related to reductions in maximal oxygen uptake.

Patients with long COVID and ME/CFS did not have muscle atrophy, but had fewer capillaries and a more glycolytic fibers, none of which were associated with maximal oxygen uptake.

While the whole-body aerobic capacity is similar following bed rest compared to patients, the skeletal muscle characteristics differed, suggesting that physical inactivity alone does not explain the lower exercise capacity in long COVID and ME/CFS.”

https://www.nature.com/articles/s41467-026-75725-y

Insights from Invasive Cardiopulmonary Exercise Testing of Patients with Myalgic Encephalomyelitis/Chronic Fatigue Syndrome

"A common question is whether exertional intolerance in ME/CFS includes potentially confounding effects of deconditioning.

However, aerobic capacity is lower in ME/CFS patients than in sedentary controls,29 and Keller’s et al longer CPET protocol documented significant decrease of peak VO2 only on day 2, both inconsistent with deconditioning.29

The current study definitively eliminates this possibility because the hallmark of deconditioning is low peak-exercise Qc,43 rather than the increased Qc discovered here, plus we saw abnormally low biventricular filling pressures rather than the higher pressures

seen in detrained individuals attributable to cardiac atrophy and decreased Ventricular compliance.44,45

While training can increase arterial-venous oxygen content difference at peak exercise, deconditioning causes little or no change in maximum exercise systemic oxygen extraction."

https://journal.chestnet.org/article/S0012-3692(21)00256-7/fulltext

Deconditioning does not explain orthostatic intolerance in ME/CFS (myalgic encephalomyelitis/chronic fatigue syndrome)

"This study shows that in ME/CFS patients orthostatic intolerance is not caused by deconditioning as defined on cardiopulmonary exercise testing. An abnormal high decline in cerebral blood flow during orthostatic stress was present in all ME/CFS patients regardless of their %peak VO2 results on cardiopulmonary exercise testing."

https://translational-medicine.biomedcentral.com/articles/10.1186/s12967-021-02819-0?utm_source=pocket-app&utm_medium=share

The Prospects of the Two-Day Cardiopulmonary Exercise Test (CPET) in ME/CFS Patients: A Meta-Analysis.

https://www.mdpi.com/2077-0383/9/12/4040/htm?utm_source=pocket-app&utm_medium=share

Chronotropic Intolerance: An Overlooked Determinant of Symptoms and Activity Limitation in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome?

https://www.frontiersin.org/articles/10.3389/fped.2019.00082/full

The abnormal Cardiac Index and Stroke Volume Index changes during a normal Tilt Table Test in ME/CFS patients compared to healthy volunteers, are not related to deconditioning.

"During a normal tilt table test decreases in SVI and CI decrease are significantly greater in ME/CFS patients than in HV, consistent with previous work. The absence of differences between patients with mild, moderate, and severe ME/CFS suggests that the decreases in stroke volumes and cardiac output are not related to deconditioning. Other factors like decreased blood volumes and autonomic dysfunction may cause this difference in the hemodynamic response between ME/CFS patients and HV."

http://bit.ly/3tpfM9h

Is Physical Deconditioning a Perpetuating Factor in Chronic Fatigue Syndrome? A Controlled Study on Maximal Exercise Performance and Relations With Fatigue, Impairment and Physical Activity.

"Physical deconditioning does not seem a perpetuating factor in CFS."

https://pubmed.ncbi.nlm.nih.gov/11200949/?utm_source=pocket-app&utm_medium=share

“Inactivity would be expected to result in a shift to type 2 fibre predominance and fibre atrophy, but type 1 predominance (23%) was more common than type 2 predominance (3%), and fibre atrophy was found in only 10.4% of cases. Patients with increased lactate responses to exercise did have significantly fewer type 1 muscle fibres ($p<0.043$ males, $p<0.0003$ females), but there was no evidence that this group was less active than the patients with normal lactate responses. No significant ultrastructural abnormalities were found.

Muscle histometry in patients with chronic fatigue syndrome generally did not show the changes expected as a result of inactivity. However, patients with abnormal lactate responses to exercise had a significantly lower proportion of mitochondria rich type 1 muscle fibres.”

https://jnnp.bmj.com/content/64/3/362