

Role of Enhanced External Counterpulsation in Long COVID

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Evidence Type	Narrative review / clinical evidence synthesis — supports RCT recommendation
ACC Relevance	Post-traumatic deconditioning, fatigue syndromes, endothelial dysfunction in injured patients

Background & Context

As of June 2024, approximately 47 million (18.3%) adults in the United States have experienced Long COVID (LC), with 12 million (4.5%) reporting limitations in daily activity. Long COVID is defined as symptoms persisting more than 12 weeks after COVID-19 infection, not explained by an alternative diagnosis. The most common symptoms include cardiac abnormalities (58%), shortness of breath (40%), fatigue (32%), and cognitive impairment (22%). Despite the scale of the condition, no FDA-approved treatments exist. The prevailing pathological mechanism is endothelial dysfunction — the same mechanism targeted by EECP therapy.

Study Objective

This letter to the editor provides an updated synthesis of evidence for EECP in Long COVID, identifying key studies missed by prior reviews and making the case for EECP as a promising therapeutic option pending randomised controlled trials.

EECP Evidence Base for Long COVID — Key Studies Reviewed

Study	n	Intervention	Control	Key Outcomes
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Dayrit et al. (2021) Cureus PMC8110286	1 (LC case report)	EECP, 15h	None	Improvements in dyspnoea, fatigue, brain fog (subjective)
Wu et al. (2023) Cardiovasc Ther PMC10764650	10 (LC-associated angina + microvascular dysfunction)	EECP, 15h	None	Improvements in brain fog, angina symptoms, fatigue, return to work; 6MWT improvement (+29.5m — NS due to small n)
Fox et al. (2024) Am J Cardiol PMC11257783	231 (LC)	EECP, 25–45h	None	SAQ +19.8±21.1; PROMIS Fatigue -13.2±9.7; DASI +20.8±14.7; 6MWT +151.6ft; 18 of 23 unable-to-work patients returned to work
Fox et al. (2024) COVID journal (sub-analysis)	66 (LC) 33 EECP + 33 matched controls	EECP, 25–45h	Free-living matched LC control	PROMIS Fatigue -15.0±8.9 vs -2.8±5.9 (p<0.001); DASI +17.8 vs +1.8 (p<0.001); >1 RDS class improvement 75.8% vs 33.3% (p<0.001)
Sathyamoorthy et al. (2024) Am J Phys Med Rehabil	38 LC with cognitive impairment + 42 LC without CI	EECP, 25–45h	EECP on non-cognitively impaired LC group	Significant improvements in BrainCheck Composite Score in cognitively impaired group

Mechanism of Action

EECP targets endothelial dysfunction — the primary pathological driver of Long COVID. In a randomised sham-controlled trial in symptomatic CAD patients, EECP improved endothelial function via a 30–50% improvement in peripheral artery flow-mediated dilation and a 171% increase in plasma endothelial-derived vasoactive agents (nitric oxide surrogates). These same mechanisms are implicated in post-acute COVID-19 sequelae. EECP is considered 'passive exercise' and delivers cardiopulmonary rehabilitation benefits without requiring patient effort — critical for post-COVID patients with exercise intolerance.

Key Findings

- All patients unable to work prior to EECF in the Fox et al. (n=231) cohort were able to return post-therapy
- Improvements in fatigue, angina burden, dyspnoea, and 6-minute walk test were consistent across all studies
- Cognitive impairment, a major driver of disability, improved significantly with EECF in the Sathyamoorthy sub-analysis
- The matched control sub-analysis by Fox et al. provides the strongest available comparative evidence to date
- Authors call for a larger randomised sham-controlled trial with 35 x 1-hour sessions as the study design
- Despite absence of FDA approval for LC, EECF appears to be the leading emerging non-pharmacological therapy

ACC Relevance

Post-traumatic fatigue, exercise intolerance, and deconditioning syndromes increasingly present within the ACC claimant population — particularly following complex injuries, prolonged immobilisation, or post-surgical recovery. The endothelial dysfunction mechanism and passive aerobic rehabilitation properties of EECF demonstrated in Long COVID are directly applicable to these ACC-covered injury sequelae. The return-to-work outcomes (100% of previously work-incapacitated patients) are directly aligned with ACC's rehabilitation mandate.

Full Citation

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