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SCIENTIFIC LETTER

Early Functional Recovery After PCI: The Underappreciated Role of Early Exercise Stress Testing

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Despite major advances in percutaneous coronary intervention (PCI) and contemporary secondary prevention strategies, the early post-procedural period remains a critical phase for functional recovery and reintegration into daily life. Current post-PCI care pathways predominantly focus on ischemia surveillance and pharmacological optimization, whereas structured approaches to objectively restore patients' confidence in physical activity remain inadequately defined.

In this context, early exercise stress testing after uncomplicated PCI may represent more than a diagnostic modality; it may also serve as a practical tool for facilitating functional recovery, improving adherence to cardiac rehabilitation, and supporting an earlier return to work and social participation. The current European Society of Cardiology recommendations emphasize early mobilization and exercise-based rehabilitation; however, they provide limited guidance on objectively assessing readiness for physical activity during the immediate post-PCI period.[1]

Notably, this perspective should be considered hypothesis-generating. Although placebo-controlled studies such as ORBITA demonstrated the limited effects of PCI on objectively measured exercise capacity, these findings do not preclude the possibility that structured post-procedural interventions may influence the behavioral and psychological aspects of recovery.

These studies demonstrate that PCI does not substantially improve objective exercise capacity under blinded conditions. However, functional recovery after PCI extends beyond physiological capacity and encompasses the behavioral, psychological, and confidence-related aspects of physical activity. Early supervised exercise testing may therefore function as a behavioral intervention that bridges the gap between perceived and actual physical capability, rather than as a means of enhancing intrinsic cardiopulmonary performance.

The psychological dimension of recovery is particularly important. Anxiety related to physical exertion and uncertainty regarding cardiovascular safety are common after PCI and may contribute to reduced activity levels and depressive symptoms. Early supervised exercise testing may help reduce these concerns by providing objective reassurance of functional capacity and cardiovascular stability. Considering that depression is consistently associated with impaired quality of life and adverse outcomes in patients with coronary artery disease, strategies that promote psychological well-being are clinically meaningful.[2,3]

Early recovery involves not only symptom control but also return to work and reintegration into society—outcomes that remain underreported despite their importance in contemporary cardiovascular care. In this context, exercise testing may be reframed not solely as a diagnostic tool but also as a structured and supervised method of graded activity exposure.

This concept differs fundamentally from routine ischemia surveillance strategies evaluated in trials such as POST-PCI, in which testing was used to guide repeat revascularization. In contrast, we propose early, selective exercise testing as a recovery-oriented intervention designed to support functional reintegration and enhance patient confidence, rather than to trigger downstream invasive procedures.

However, whether such a strategy improves patient-centered outcomes remains unknown and warrants prospective evaluation.

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We therefore propose that early exercise testing be considered within the framework of "behavioral cardiology," in which objective reassurance may translate into improved activity patterns independent of changes in maximal exercise capacity.

Current guidelines provide limited guidance regarding the timing and role of functional testing in stable patients following successful PCI. This approach would be most applicable to carefully selected, hemodynamically stable patients who have undergone complete revascularization and experienced no procedural complications. Prospective studies evaluating patient-reported outcomes, return to work, and adherence to cardiac rehabilitation are warranted to further define its clinical value.

The limitations of this proposed concept should be acknowledged. Currently, no randomized trials have specifically evaluated early exercise stress testing as a behavioral intervention following uncomplicated PCI. Consequently, the proposed benefits with respect to rehabilitation adherence, return to work, and psychological recovery remain speculative and should be regarded as hypothesis-generating.

In summary, early exercise stress testing after uncomplicated PCI should not currently be viewed as a strategy for routine ischemia surveillance. Rather, it may represent a promising recovery-oriented intervention that warrants prospective investigation in carefully selected patients.

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