Editorial

Beyond the Best Exercise: A Personalized Approach to Parkinson's Disease Rehabilitation

Kazem Malmir*

Department of Physiotherapy, School of Rehabilitation, Tehran University of Medical Sciences, Tehran, Iran.

***Corresponding author:** Kazem Malmir, Associate professor
Department of Physiotherapy, School of Rehabilitation, Tehran University of Medical Sciences, Tehran, Iran.
Email: kmalmir@tums.ac.ir
Tel: 09195889548

Orcid ID:
Kazem Malmir: 0000-0002-0801-2597

Article info:
Received: 10 May 2026
Accepted: 13 May 2026

Citation: Malmir K. Beyond the Best Exercise: A Personalized Approach to Parkinson's Disease Rehabilitation. Journal of Modern Rehabilitation. 2026;20(4):?-?

Running title: Personalized Rehabilitation in Parkinson's Disease

Editorial

Exercise is now an essential part of Parkinson's disease (PD) management. The more useful question is no longer whether people with PD should exercise, but which exercise best suits a particular person, at a particular stage, and for a particular goal. The search for the "best" program is understandable, but PD does not present in the same way for everyone. One person may be limited mainly by bradykinesia and reduced movement amplitude, another by postural instability and falls, and another by axial rigidity, low motivation, or difficulty sustaining exercise. Rehabilitation should therefore be individualized rather than built around a single preferred program. LSVT BIG, HiBalance, supervised therapeutic climbing, and community-based non-contact boxing illustrate this principle. They differ in their target impairments, intensity, supervision requirements, accessibility, and potential for long-term adherence. The key clinical question is not which program is best overall, but which intervention fits the patient's problems, goals, safety, preferences, and circumstances.

An intensive intervention may produce an important initial improvement, but its value is limited if the patient cannot remain active afterward. Rehabilitation should therefore be viewed as a continuum: targeted treatment for a specific impairment, followed by an activity that the person can and wants to continue.

Matching the intervention to the problem

LSVT BIG focuses on large-amplitude, repetitive movements intended to improve movement scaling and recalibrate the perception of normal movement. Trials and reviews have reported improvements in motor function and gait, particularly when the intensive protocol is delivered as designed [1,2]. Physiological findings also suggest that proprioceptive recalibration may contribute to its effects [3]. However, LSVT BIG requires time, motivation, physical capacity, and access to trained therapists. It may be most suitable for people with mild-to-moderate disease who can tolerate intensive, therapist-led treatment [1,2].

HiBalance targets postural instability through challenging balance tasks, sensory integration, anticipatory postural adjustments, and dynamic postural control. Studies have reported improvements in balance and gait, with neuroimaging findings suggesting possible task-related brain changes [4]. Benefits have not been uniform, however, and attention, expectations, and social interaction may influence outcomes [5,6]. HiBalance may be particularly relevant for patients with impaired balance or recurrent falls, but its cognitive demands should be considered because successful performance requires attention, learning, and adaptation.

Therapeutic climbing combines large limb and trunk movements, weight shifting, vertical loading, postural control, and visuomotor problem solving. Randomized and secondary analyses have reported improvements in motor signs, posture, gait, and mobility, while feasibility studies suggest good adherence and engagement [7-10]. Nevertheless, much of the evidence comes from a relatively small research network, and independent replication is needed. Proposed mechanisms, such as improved axial control and transfer of vertical skills to walking, are reasonable, but they have not yet been firmly established. Climbing may suit selected patients with axial or postural difficulties, but it requires specialized facilities, trained supervision, and careful safety procedures.

Community non-contact boxing is dynamic, social, and engaging. Studies and reviews have reported benefits in motivation, mood, adherence, fitness, and selected motor outcomes [11,15]. Randomized trials, however, have not consistently shown superior effects on core motor symptoms [12,13]. Its main strength may therefore be its ability to help people remain active. An enjoyable program continued for years may be more valuable in practice than a highly effective program abandoned after several weeks.

From treatment selection to treatment sequencing

These interventions support a straightforward principle: match the intervention to the problem, not every patient to the same program. LSVT BIG may be appropriate for reduced movement amplitude; challenging balance training for postural instability and falls; supervised climbing for selected patients with axial or postural difficulties; and boxing or another enjoyable group activity for motivation, participation, and long-term exercise. These options are not mutually exclusive. Patients often have several interacting impairments, so clinical reasoning must remain flexible. A practical model is to distinguish between an intensive treatment phase and a maintenance phase. During an 8–12-week targeted program, treatment can focus on a clearly defined impairment or functional goal. Thereafter, activity can shift toward an accessible and enjoyable program that the patient can sustain. This sequence is clinically appealing but is not yet a validated treatment algorithm. Whether targeted treatment followed by community-based maintenance is better than ongoing supervised therapy remains unknown and should be tested in pragmatic trials [1,7,11].

A simple framework for clinical reasoning

Current research often identifies effective programs without explaining how to choose among them. Table 1 offers a preliminary framework based on dominant motor problems, falls and safety, cognitive and learning capacity, patient goals, and available resources. It is intended to support clinical reasoning, not to function as a rigid algorithm. Cognitive screening, including the MoCA, may help clinicians judge whether a patient can manage complex instructions or cognitively demanding tasks, but no single score should determine treatment selection.

Table 1. **A practical framework for selecting rehabilitation priorities in Parkinson's disease**

Clinical consideration	**LSVT BIG**	**HiBalance**	**Supervised therapeutic climbing**	**Community non-contact boxing**
Dominant problem	Bradykinesia and reduced movement amplitude	Postural instability, impaired balance, or falls	Axial rigidity, stooped posture, or reduced trunk extension	Low activity, poor motivation, or preference for social exercise
Safety	Requires ability to tolerate intensive repetitive movement	Close supervision is important	Requires screening, equipment, and a controlled setting	Non-contact format preferred; balance and cardiovascular status should be considered
Cognitive demands	Responding to intensive cueing	Attention and adaptation to challenging balance tasks	Visuomotor planning and learning	Adaptable to the patient's cognitive capacity
Typical goal	"I want to move bigger and walk better."	"I want to improve my balance and reduce falls."	"I want to stand straighter and move more freely."	"I want to stay active and connected with others."
Practical needs	Trained therapists and an intensive schedule	Appropriate supervision and balance challenges	Specialized facility and safety procedures	Often more accessible in community settings
Potential role	Targeted intensive treatment	Targeted intensive treatment	Targeted treatment for selected patients	Maintenance or complementary activity

Abbreviations: LSVT BIG, Lee Silverman Voice Treatment BIG; HiBalance, highly challenging balance training; MoCA, Montreal Cognitive Assessment.

After the initial treatment

Because PD is chronic, gains achieved during supervised therapy should lead to sustainable physical activity. A pragmatic pathway may include:

1. **Targeted phase:** Choose an intervention according to impairment, goals, safety, preferences, and resources.
2. **Maintenance phase:** Continue with community, home-based, group, or other feasible exercise.

3. **Reassessment:** Review falls, function, participation, and adherence rather than assuming the initial program remains appropriate.
4. **Combination strategies:** Combining programs, such as climbing and boxing, may be reasonable, but remains a clinical hypothesis rather than an established superior approach.

Whether patients continue exercising after treatment should be considered a meaningful outcome. Adherence is not merely an implementation issue; it is part of rehabilitation effectiveness.

Improving the evidence base

Future trials should report intervention dose, progression, therapist training, supervision, adherence, and safety in sufficient detail for replication. TIDieR and CERT provide useful reporting frameworks [16,17]. Studies should also account for expectation, therapeutic alliance, social interaction, novelty, and attention, particularly in engaging group programs. Measures such as the Credibility/Expectancy Questionnaire and therapeutic-alliance scales may help. Active social or exercise controls are preferable to usual care or wait-list controls when feasible. External validation is also needed. Results from specialized centers with motivated participants and experienced therapists may not translate directly to routine clinics, community facilities, rural areas, or resource-limited health systems. Finally, the proposed framework should be treated as hypothesis-generating. It can be piloted, refined through patient and clinician feedback, and tested prospectively. Its value should be judged not only by short-term motor improvement, but also by adherence, participation, quality of life, and patient-centered outcomes.

Conclusion

There may never be one “best” exercise for Parkinson’s disease. The more useful goal is to identify the right intervention for the right patient at the right time. Rehabilitation should begin with the person’s dominant impairments and goals, use intensive treatment when appropriate, and then emphasize activities that can realistically continue in daily life. Specialized programs remain valuable, but their success should not be judged only by what happens during an 8- or 12-week intervention. It should also be judged by what remains afterward: better function, greater confidence, continued activity, and a plan the patient can make part of life.

Acknowledgements

During preparation of this work, the author used ChatGPT (OpenAI) for grammar checking and language polishing. The author reviewed and edited the manuscript and takes full responsibility for its content.

Authors’ contributions

K. M. conceived the framework, synthesized the evidence, drafted the manuscript, and approved the final version for submission.

Funding

There is no external funding for this study.

Competing interests

The author declares no competing interests.

References

1. Fox C, Ebersbach G, Ramig L, Sapir S. LSVT LOUD and LSVT BIG: Behavioral Treatment Programs for Speech and Body Movement in Parkinson Disease. Parkinsons Dis. 2012;2012:391946. doi: 10.1155/2012/391946.
2. McDonnell MN, Rischbieth B, Schammer TT, Seaforth C, Shaw AJ, Phillips AC. Lee Silverman Voice Treatment (LSVT)-BIG to improve motor function in people with Parkinson's disease: a systematic review and meta-analysis. Clin Rehabil. 2018;32(5):607-618. doi: 10.1177/0269215517734385.
3. Peterka M, Odorfer T, Schwab M, Volkmann J, Zeller D. LSVT-BIG therapy in Parkinson's disease: physiological evidence for proprioceptive recalibration. BMC Neurol. 2020;20(1):276. doi: 10.1186/s12883-020-01858-2.
4. Albrecht F, Pereira JB, Mijalkov M, Freidle M, Johansson H, Ekman U, Westman E, Franzén E. Effects of a Highly Challenging Balance Training Program on Motor Function and Brain Structure in Parkinson's Disease. J Parkinsons Dis. 2021;11(4):2057-2071. doi: 10.3233/JPD-212801.
5. Freidle M, Johansson H, Ekman U, Lebedev AV, Schalling E, Thompson WH, Svenningsson P, Lövdén M, Abney A, Albrecht F, Steurer H, Leavy B, Holmin S, Hagströmer M, Franzén E. Behavioural and neuroplastic effects of a double-blind randomised controlled balance exercise trial in people with Parkinson's disease. NPJ Parkinsons Dis. 2022;8(1):12. doi: 10.1038/s41531-021-00269-5.
6. Malmir K, Ashrafganjooie M. Effects of HiBalance training program on physical function of individuals with idiopathic Parkinson disease: a systematic review and meta-analysis. Eur Geriatr Med. 2023;14(6):1273-1288. doi: 10.1007/s41999-023-00860-4.
7. Langer A, Hasenauer S, Flotz A, Gassner L, Pokan R, Dabnichki P, Wizany L, Gruber J, Roth D, Zimmel S, Treven M, Schmoeger M, Willinger U, Maetzler W, Zach H. A randomised controlled trial on effectiveness and feasibility of sport climbing in Parkinson's disease. NPJ Parkinsons Dis. 2021;7(1):49. doi: 10.1038/s41531-021-00193-8.
8. Langer A, Roth D, Santer A, Flotz A, Gruber J, Wizany L, Hasenauer S, Pokan R, Dabnichki P, Treven M, Zimmel S, Schmoeger M, Willinger U, Gassner L, Maetzler W, Zach H. Climb up! Head up! Climbing improves posture in Parkinson's disease. A secondary analysis from a randomized controlled trial. Clin Rehabil. 2023;37(11):1492-1500. doi: 10.1177/02692155231174990.
9. Langer A, Hansen C, Roth D, Santer A, Flotz A, Gruber J, Wizany L, Hasenauer S, Pokan R, Dabnichki P, Treven M, Zimmel S, Schmoeger M, Willinger U, Gassner L, Brücke C, Maetzler W, Zach H. Vertical locomotion improves horizontal locomotion: effects of climbing on gait and other mobility aspects in Parkinson's disease. A secondary analysis from a randomized controlled trial. J Neuroeng Rehabil. 2024;21(1):63. doi: 10.1186/s12984-024-01363-4.
10. Gassner L, Dabnichki P, Pokan R, Schmoeger M, Willinger U, Maetzler W, Moser H, Zach H. Therapeutic climbing in Parkinson's disease: Differences in self-reported health and well-being, feasibility and clinical changes. Physiother Theory Pract. 2023;39(6):1163-1177. doi: 10.1080/09593985.2022.2036279.
11. Morris ME, Ellis TD, Jazayeri D, Heng H, Thomson A, Balasundaram AP, Slade SC. Boxing for Parkinson's Disease: Has Implementation Accelerated Beyond Current Evidence? Front Neurol. 2019;10:1222. doi: 10.3389/fneur.2019.01222.

12. Domingos J, de Lima ALS, Steenbakkers-van der Pol T, Godinho C, Bloem BR, de Vries NM. Boxing with and without Kicking Techniques for People with Parkinson's Disease: An Explorative Pilot Randomized Controlled Trial. J Parkinsons Dis. 2022;12(8):2585-2593. doi: 10.3233/JPD-223447.
13. Sangarapillai K, Norman BM, Almeida QJ. Boxing vs Sensory Exercise for Parkinson's Disease: A Double-Blinded Randomized Controlled Trial. Neurorehabil Neural Repair. 2021;35(9):769-777. doi: 10.1177/15459683211023197.
14. Smith RA, Hellman AA. Evaluating climbing interventions for Parkinson's disease: a systematic review. Front Sports Act Living. 2026;8:1695888. doi: 10.3389/fspor.2026.1695888.
15. González-Devesa D, Ayán C, Sanchez-Lastra MA, Gutiérrez-Hong C, García-Fresneda A, Diz JC. The Efficacy of Boxing Training on Patients with Parkinson's Disease: Systematic Review and Meta-Analysis. Rev Neurol. 2024;79(11):36478. doi: 10.31083/RN36478.
16. Hoffmann TC, Glasziou PP, Boutron I, Milne R, Perera R, Moher D, Altman DG, Barbour V, Macdonald H, Johnston M, Lamb SE, Dixon-Woods M, McCulloch P, Wyatt JC, Chan AW, Michie S. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. BMJ. 2014;348:g1687. doi: 10.1136/bmj.g1687.
17. Slade SC, Dionne CE, Underwood M, Buchbinder R. Consensus on Exercise Reporting Template (CERT): Explanation and Elaboration Statement. Br J Sports Med. 2016;50(23):1428-1437. doi: 10.1136/bjsports-2016-096651.