

# Evidence Based of Robotic-Assisted Treadmill Training in Adults with Cerebral Palsy

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## ABSTRACT

Adults with cerebral palsy (CP) have motor impairments that differently affect their functioning. As they age, there are a few common physical challenges such as increased spasticity, loss of strength and flexibility, declining mobility, fatigue, overuse injuries, and falls. Physical activities and gait training in adults with CP is recommended for boosting strength, endurance, cardiorespiratory fitness, and muscle flexibility in addition to preventing osteoporosis and chronic musculoskeletal pain. Robotic-assisted treadmill training (RATT) has been applied in the last two decades, enabling an individualized approach, physiological gait pattern, and intensive training through repetitions positively influencing function. Aims: The goal of this presentation is to share reflection and synthesized evidence on the efficacy of RATT on motor functions, gait speed, endurance, intensity of the sessions, and sustainability of effects in adults with CP. Additionally, to identify the barriers and challenges in accessing RATT. Methods: The evidence is drawn from the randomized control trials (RCT) and systematic reviews of the last five years available through PubMed, Cochrane Library, and Google Scholar and reflected upon based on the current clinical practice. Results: Only one RCT included adults with cerebral palsy which showed that RATT significantly improves gross motor functions and carry-over effects were seen for 3-4 months after RATT. Two systematic reviews with meta-analysis reported that RAGTT is more effective than conventional therapy for improving gait velocity, gait endurance, gross motor functions, and postural control in children and adults with CP. On the contrary two other systematic reviews found weaker and inconsistent evidence on the use of RAGTT for gait and motor function on children, adolescents, and young adults with CP. RATT is expensive for both purchase and maintenance. Hence, limited availability, access, and high cost of sessions are the major barriers for patients. Conclusion: To improve well-being and health in adults with cerebral palsy, physical activities including gait training are crucial to maintain ambulatory function and prevent musculoskeletal consequences due to aging. Although RATT is beneficial, due to its limited access, there are no larger studies available. Future studies should involve a larger number of participants, higher methodological quality, and standardization of reporting robotic parameters.