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Posters

Inclusion of biomarker determination opens up the possibility of understanding the biological mechanisms of recovery and supports future drug development.

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Automatic versus manual tuning of robot-assisted gait training in people with neurological disorders

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Introduction: In clinical practice, therapists choose the amount of assistance that patients receive while walking in a robotic gait trainer. A disadvantage is that therapists cannot directly feel what the device does. Therefore, algorithms were developed that automatically adjust the assistance, however, they have not been compared to the settings that therapists would choose.

Main objective: The goal of this study was to compare the assistance set by an automatically-tuned (AT) algorithm to manually-tuned (MT) assistance in a robotic gait trainer.

Methods: Ten participants (6x stroke, 4x spinal cord injury) walked with both approaches in the LOPES II gait trainer. In both cases, the assistance was adjusted for various subtasks of walking (e.g. step height). Either the therapist changed the assistance for each subtask (MT) or the AT algorithm adjusted the assistance based on errors compared to reference trajectories.

Results and discussion: The different approaches did not always focus on the same subtasks. On average, participants received less assistance with the AT algorithm for all subtasks. In spite of this, the largest errors compared to the reference trajectory were found for the MT approach. A possible reason for this is that therapists might focus on other factors while setting the assistance.

Conclusion: An automatically-tuned algorithm can decrease deviations from a reference trajectory, however, large differences were found compared to the settings chosen by a therapist and further research should focus on how this information can be used to optimize robotic gait therapy.

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