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# Advanced technologies to assess motor dysfunction in children with cerebral palsy



Walking is often a challenging activity for patients with cerebral palsy. Although several treatments are available that target different underlying impairments, the selection of an optimal treatment for a specific patient is difficult. Therefore, advanced measurement systems are necessary to improve the identification of a patient's impairments and gait limitations. The aim of this thesis was to evaluate the feasibility and validity of the motorized hyper-resistance test and interactive gait lab to clinically assess motor (dys)function in children with cerebral palsy. The motorized hyper-resistance test could potentially be used to differentiate between neural and tissue related impairments in a specific patient. As for the interactive gait lab, walking with self-paced speed and a virtual reality environment could offer a suitable alternative to conventional overground clinical gait analysis. In addition, its feature of applying treadmill perturbations could be a promising technique for functional assessment of stretch reflexes during interactive treadmill gait analysis.



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