

KinectLAB for MFM Evaluation Scale

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Technological advances and commercial low cost products like the Microsoft Kinect are now available for everyone and especially researchers. Thanks to these kind of equipment, interactive exercises focus on repetitive motion, range of motion, pressure and force, and tactile discrimination, which are all part of our activities for daily living needs can be easily developed with and proposed to physicians. Research activities with disabled children can be focused on the development of ludic interface too, which motivate this patient during clinical motor evaluation for example.

The Motor Function Measure (MFM-32 items) is a tool that we consider as essential for the patient's motor function assessment and allows following a patient along the whole course of his disease. Validation studies performed in various diagnostic populations confirmed its metrologic properties especially its sensitivity to change. It has an unquestionable interest for those who already use it in many countries for clinical monitoring of patients. This tool was selected as primary outcome in some clinical studies (TROPHOS, Clinical Trials number NCT01302600, and ASIRI, Clinical Trials number NCT01302600, studies).

To propose a MFM to a patient assumes the availability of a trained therapist. Unfortunately, even though standardized MFM training sessions, certain variability in the scoring procedure of MFM items remains depending on the evaluator. The originality of our approach is to use entertaining activities to measure quantitatively the activity limitation of children by a technological tool that avoids the hazardous characteristic of the human evaluation and increase children's compliance for the evaluation.

Authors propose to implement the Microsoft Kinect, which presents interesting measurement advantages in the context described. The first step was to evaluate the variability of the professional who practice the evaluation. Then, the main challenge was to develop a software tool named KinectLAB on some choosing items from the MFM with the practitioners. This system allows to capture the Kinect digital skeleton and particularly anatomical joints of a patient. Experiments were proposed to adjust the KinectLAB algorithm strategy to measure the activity limitation in this research context. The first experiments made on 5 items from the MFM with 3 volunteers' patients showed that the algorithm score and the practitioners' evaluation score are exactly the same. Works are on going specifically on Spinal Muscular Atrophy patients to develop a tool usable in clinical trials