

# MOTOR NEUROREHABILITATION IN PATIENTS WITH HEMIPLEGIA



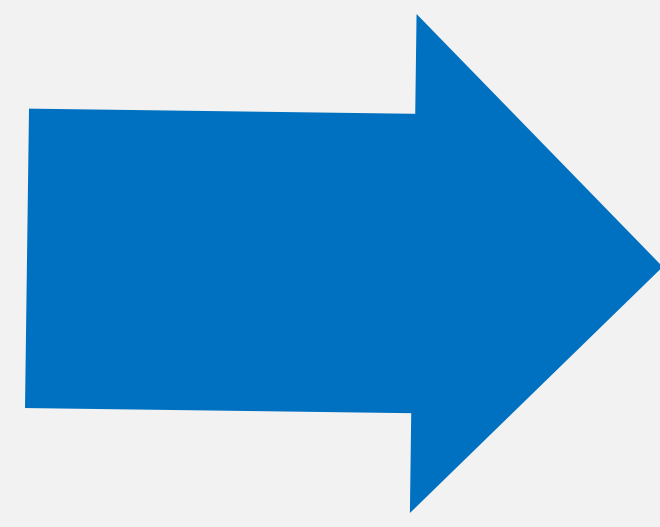
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## PURPOSE:

The aim of the present study is to present a case report with hemiplegia where, in addition to all kinesitherapists and a physical plan, the rehabilitation included robotic therapy of the lower limbs, where a robot-assisted exoskeleton (Locomat) was used.



## MATERIALS AND METHODS:

The robotic therapy together with the comprehensive rehabilitation treatment is carried out within twenty days with a rest on the 10th day of one week to show the patient's progress between the two treatments of 10 days each and to determine how much the robotic therapy has effect on motor neurorehabilitation in hemiplegic patients. In order to determine the independence and mobility of the patient at the beginning, on the 10th day and on the 20th day, the Barthel index test and the Fugl-Meyer assessment test were performed.

**RESULTS:** According to the analysis and processing of the results obtained from the robot-assisted exoskeleton itself and after their statistical processing, they show a significant improvement in the results in the second period of rehabilitation compared to the first rehabilitation, which means that the patient took a significant part in the movement itself with the robot-assisted exoskeleton and a significant patient improvement in terms of walking distance, meters walked, treadmill speed, driving force and body weight support. The overall result also results in an improvement in coordination and the establishment of a straight pattern of walking, which only hinders further rehabilitation. The results of the Bartel index test shows the progress of the patient and the improvement of his mobility, while the Fugl-Meyer assessment test shows the improvement of motor function and sensitivity.

Figure 1. View of passed meters

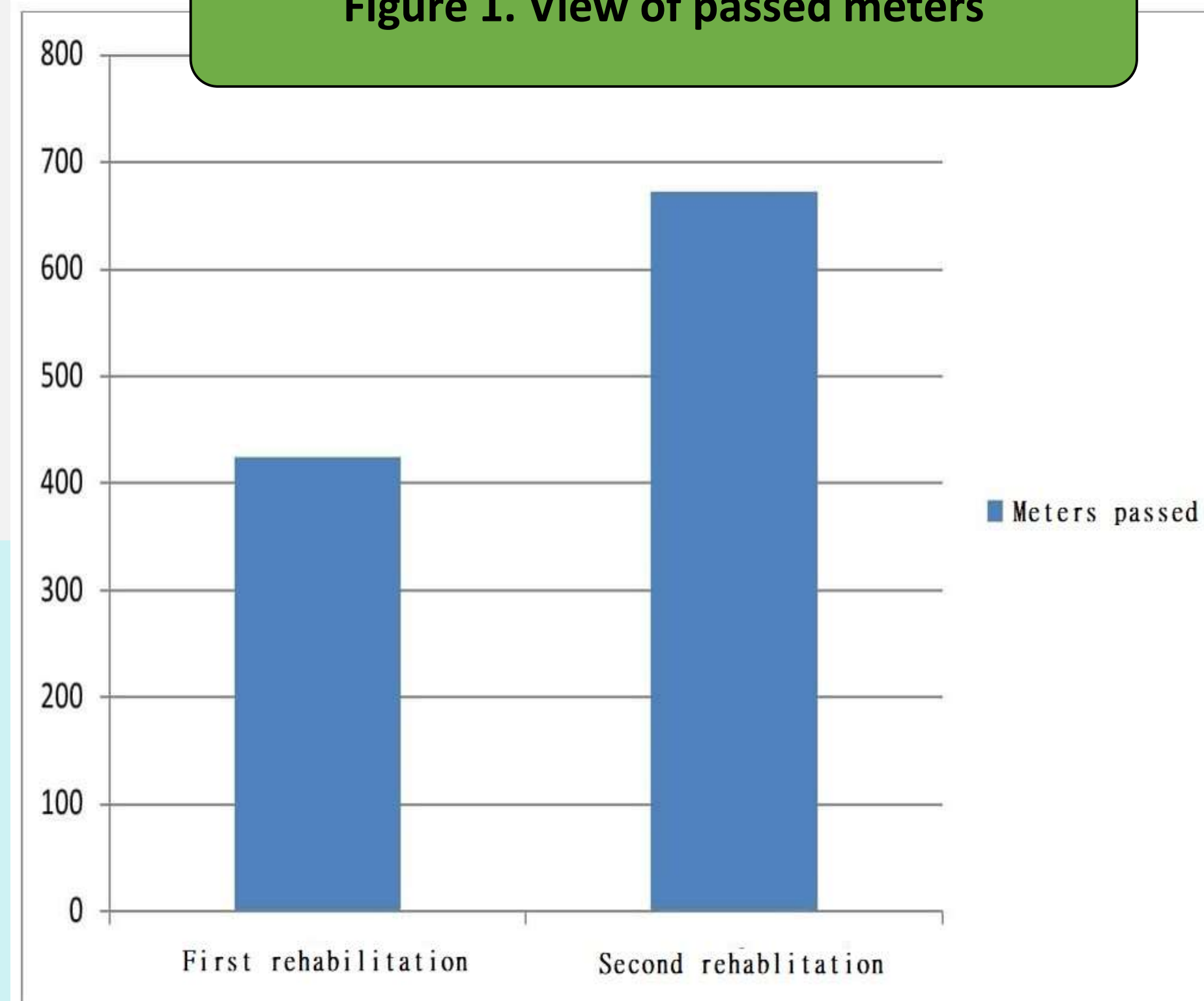
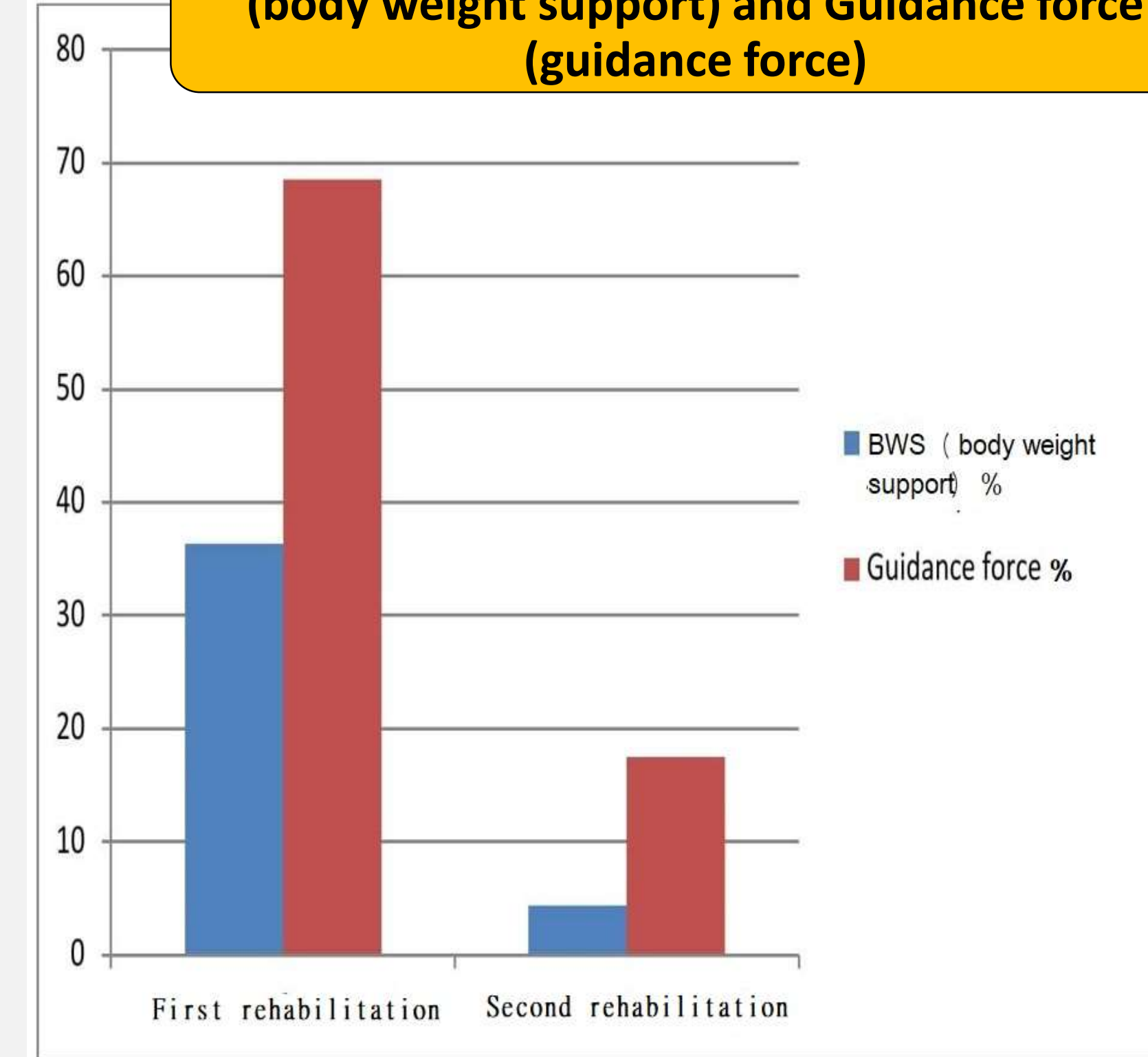


Figure 2. Illustration of the reduction in BWS (body weight support) and Guidance force (guidance force)



Barthel index



Figure 3. Graphic display of the changed values according to the Bartel index after the first and after the second rehabilitation

FMA TEST

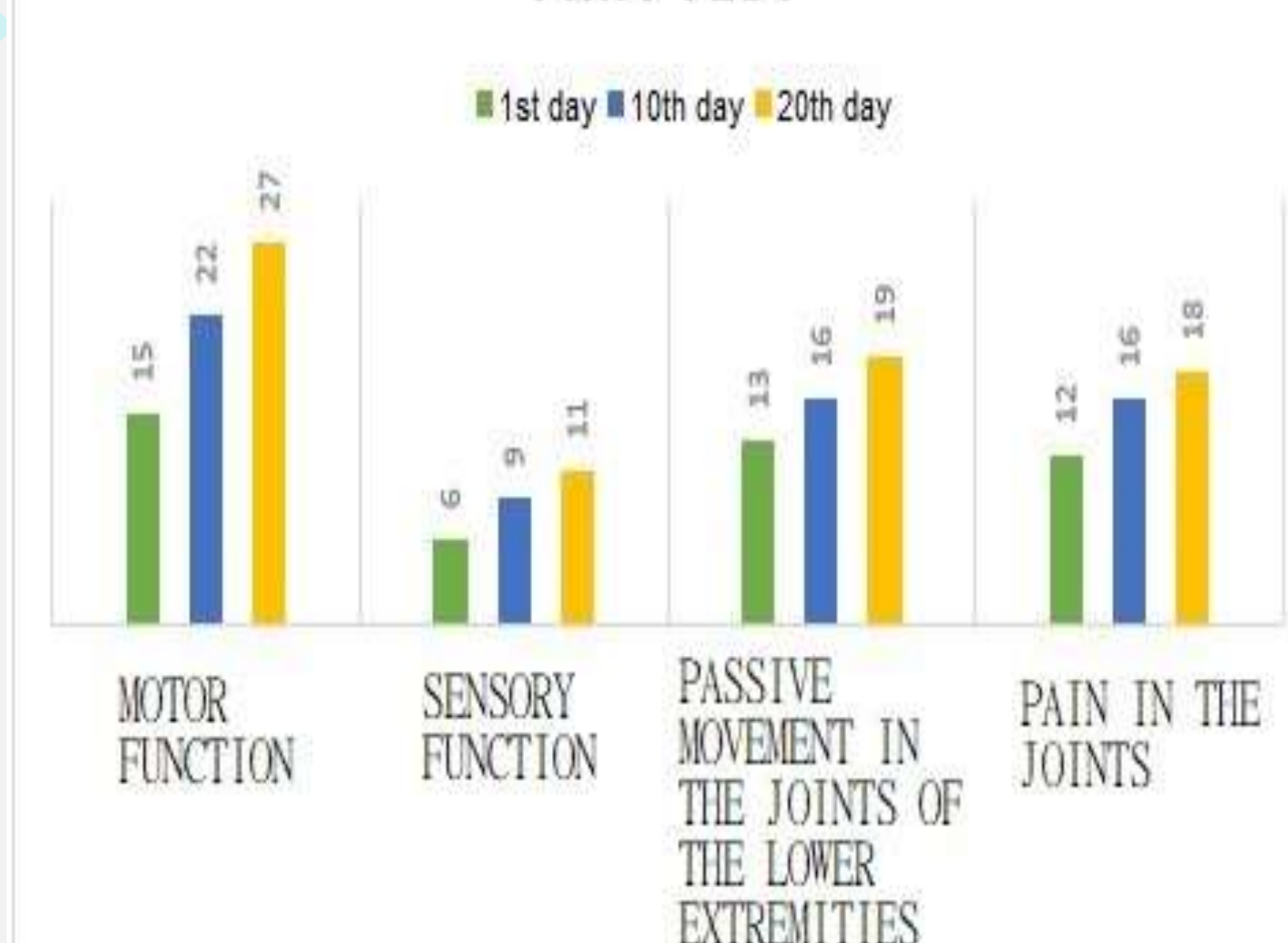


Figure 4. Graphic display of the values from the Fugl - Meyer assessment test



Figure 5. LokomatPro – a robot-assisted exoskeleton for the rehabilitation of lower limbs

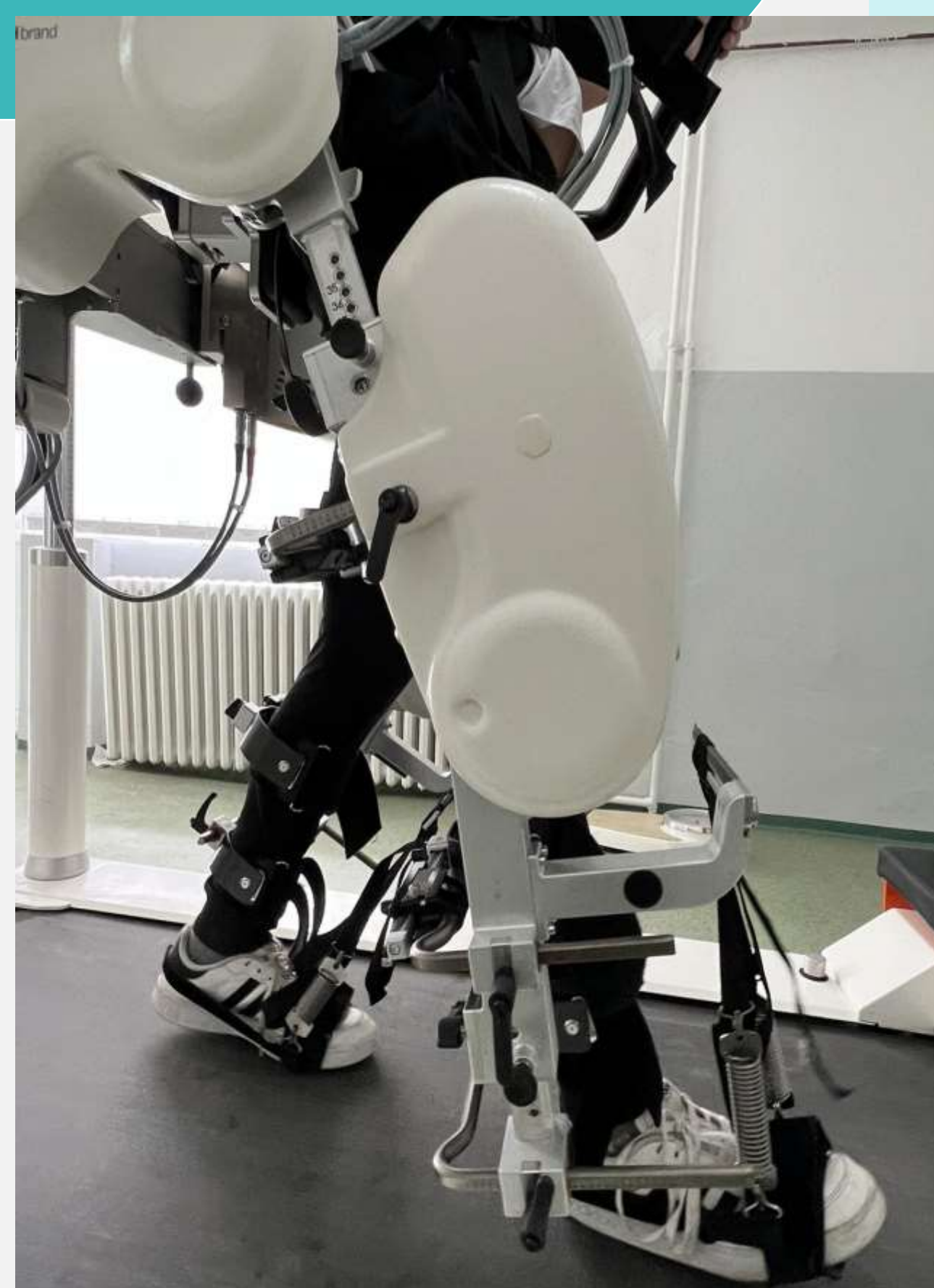


Figure 6. View of the patient in dynamic mode

**CONCLUSION:** Robotic therapy, although it is still being developed and despite its inaccessibility in terms of the price of treatments, shows a significant improvement in motor function and in motor neurorehabilitation in patients with hemiplegia.