

## **Abstract**

This diploma thesis deals with the issue of robotic-assisted therapy, namely with the mechanical exoskeleton robotic device Armeo Spring, and it is focused on an acute stroke population. The aim of this study is to evaluate the efficiency of a robotic-assisted therapy using Armeo Spring device and to compare it with the efficiency of a common individual occupational therapy focused on improving motor function of upper extremity of patients with the acute stroke.

There were 19 patients involved in the research, who were hospitalized in early rehabilitation acute beds. They were selected on the basis of entry criteria and further divided into two groups. An experimental group included 10 participants (n=10), a control group included 9 participants (n=9). The patients in the experimental group using Armeo Spring device underwent four to five 30-minutes therapies per week for three week period, the control group underwent the same amount of individual occupational therapies focused on improving motor function of a paretic upper limb. Each participant, evaluated before and after the intervention, underwent the total number of 12 therapy sessions.

In the face of the determined hypothesis, following methods were used to evaluate the sample of patients: Function Independence Measure (FIM) for evaluating rate of independence, Jamar Dynamometer (JD) for evaluating a handgrip, Fugl-Meyer Assessment and modified Frenchay Arm Test (mFAT) evaluating motor function of paretic upper extremity.

The study shows statistically significant improvement ( $p < 0,05$ ) of several parameters in both groups of patients. In the experimental group, there was statistically significant improvement in the FIM, the Fugl-Meyer Assessment, the mFAT, and in some pitches in JD measurement. However, when comparing the two groups, there was no statistically significant difference. The improvement with higher significant rate ( $p < 0,1$ ) was observed in just one parameter, which is the second pitch of JD measure.

In conclusion, the study has shown that the use of robotic-assisted therapy via Armeo Spring device in the acute phase is effective in the above mentioned items, however, it does not substitute the presence of a therapist and it is not significantly more effective than common occupational therapy focused on improving motor function of upper extremity, either.