

FINITE ELEMENT ANALYSIS OF AN ANKLE JOINT REHABILITATION EQUIPMENT

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Abstract: *The aim of this article is to present a simulation of a pneumatic muscle actuated rehabilitation equipment for the ankle affections using CATIA V5R19 Software. The rehabilitation equipment allows performing isokinetic exercise, being known that those are the fastest way of recovery the areas affected. It is presented the equipment to be analyzed, the material, type of analysis, the constraints and the loads applied. After analyze is made, the soft shows the results, which are interpreted. The results of the analysis, Von Misses stresses and displacements show the resistance of the equipment under the imposed requirements.*

Keywords: *rehabilitation equipment, Finite Element Modeling, CATIA, pneumatic muscle, actuator*

1. General Introduction

The paper presents finite element modeling of an ankle rehabilitation equipment. The rehabilitation equipment proposed for the analysis allows performing isokinetic exercises for ankle affections recovery.

Isokinetic testing is the standard for assessing muscle and joints. The response to the torque applied to ensure that the patient's limb speed increases or decreases with time applied during the acceleration and deceleration, allowing measurement of neuromuscular control[4], [5].

The proposed rehabilitation equipment is designed for ankle joint affections recovery. It can be used both in physical therapy and sports medicine centers, as tools in therapeutic exercise programs. The position of the leg is the one presented in Figure 1.



Figure 1 *The position of the leg on the rehabilitation equipment[3]*

The movements made by the projected rehabilitation equipment are presented in Figure 2.

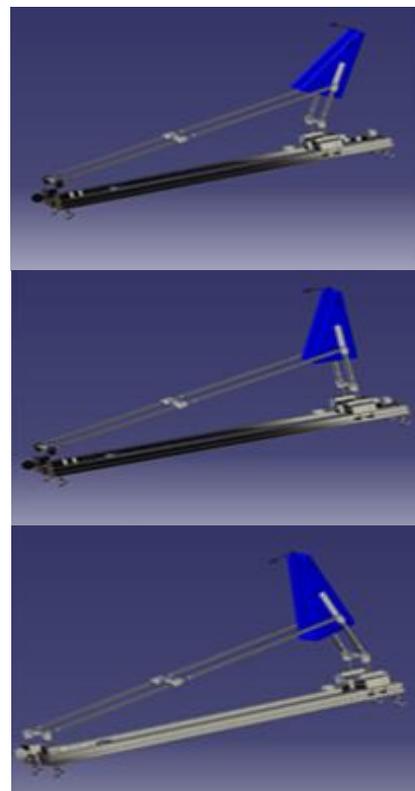


Figure 2 *Movements of the rehabilitation equipment*