

## **Using the 3D printing procedure for self-stabilizing medical devices**

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### **Abstract.**

Patients with Parkinson's disease are restricted in various activities, including feeding or personal hygiene. Medical treatments as well as recovery methods or stabilization training are complemented by training patients to use medical systems to help them in their daily activities. This paper presents two medical devices constructive variants used for Parkinson's disease patients, who need support systems to perform routine activities. Because these devices address the patients' categories with different characteristics and habits, they are designed and made individually, in relation to hand and its joint anthropometric dimensions, also in relation to dysfunction degree and respectively in relation to the primary needs of patient users of these devices. That is why it was considered that the 3D printing procedure is the most efficient method to obtain personalized, light, interchangeable and even aesthetic devices. What is most important in the devices development consists in a rigorous process of determining as accurately as possible the dimensions and forces of the components, and also the comfort degree that this system provides in use by patients with Parkinson's disease. The way to make by 3D printing the two tools most used by the Parkinson's patient in his daily activity - teaspoon and fork are presented in the paper third part. In the paper final part, the conclusions from the design process, made by 3D printing and testing in use to obtain self-stabilization of devices are presented. Through these aspects, one can appreciate the high utility of these devices, but also the optimization possibilities in construction and design.