

ABSTRACT

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Title:

The Design of Universal Models of Assistive Devices for Production Using a 3D Printing to Improve the Self-sufficiency of People with Acquired Brain Injury

Abstract:

Background: Patients with acquired brain injury often need to be equipped with personalized compensatory aids to increase paretic upper limb involvement and self-sufficiency. One of technologies for production of aids is 3D printing, which is use abroad. Limit is professional and time consuming in preparation of 3D models of printing aids. Reducing this complexity is possible by creating universal 3D models that allow change dimensions of aid without professional intervention.

Goal: Main goal is design universal 3D models of aids. Aids help patients engage paretic upper limb and increase self-sufficiency. Based on analysis, activities of daily living in patients with acquired brain injury were selected.

Methodology: Author created Record Form data collection, guidelines were created to minimize subjectivity in acquisition of data from occupational therapists. Author collected data at Rehabilitation Institute Kladruby and ERGO Aktiv o.p.s. Record form was distributed to occupational therapists working with target group of patients, but models were created from collected data by author.

Results: Based on the evaluation of author's data, universal 3D models were created for: cutlery handle, handle for cup and writing aid.

Conclusion: Use 3D printing technology is very promising for field of occupational therapy. There are several ways to deal with professional demands. Creation of universal 3D models corresponds to considered extension and acceleration of preparation of aid in "JIT (just in time)" mode. Due to small sample, models are universal only for tested sample. For real application, it is necessary to subject proposed models and Record Form to testing.

Key words: Assistive Devices, 3D Printing, Acquired Brain Injury, Self-sufficiency, Occupational Therapy