Measuring the natural learning processes of a novice amputee learning to use a myoelectric prosthesis

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To measure the natural learning processes that take place while learning to use a myoelectric prosthesis. The second objective is to compare the results with a study of the learning processes in able-bodied participants who learn to use a...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Therapeutic procedures and supportive care NEC
Study type	Interventional

Summary

ID

NL-OMON33041

Source
ToetsingOnline

Brief title
Learning processes of novice prosthetic user

Condition

- Therapeutic procedures and supportive care NEC

Synonym
amputation, amputee

Research involving
Human

Sponsors and support

Primary sponsor: Rijksuniversiteit Groningen
Source(s) of monetary or material Support: Otto Bock BV,Prothesefabrikant Otto Bock;Duitsland

Intervention

Keyword: Learning, Myoelectric, Prosthesis, Upper Limb

Outcome measures

Primary outcome

Test: time of execution of the tests tasks and the scores of these tasks in

Index of Functionality.

Training:

Movement kinematics: movement reach time, movement grasp time, velocity of the

reach, peak velocity of the reach, symmetry of the velocity profile, hand

aperture, plateau phase in the hand aperture, velocity of hand opening and

closing, and the timing between the reach and the grasp movement;

Applied grip force;

EMG-signals of the extensors and flexors of the wrist: maximum value and number

of peaks

the pattern of the gaze of the participants: the sequence in which the objects

are fixated during a trial

Secondary outcome

Analysis of the videos recorded during the occupational therapy

Analysis of the daily diary in which the patients wrote down how often they

used their prosthesis during daily life and in which way they used their

prosthesis

Study description

Background summary

People with an upper extremity amputation often choose to have fitted a prosthesis to restore the functionality for as best as possible, but the rejection rate of prosthetic devices is high, mainly due to a low degree of functional use (Biddis and Chau, 2007; Dudkiewicz et al., 2004; Kyberd et al., 1998; Plettenburg, 2002). This functional use can be enhanced by training (Carter, Torrance and Merry, 1969; Lake, 1997; Weeks, Anderson and Wallace, 2003). We expect that by enhancing the functional use through training, this raises the overall use of prostheses. The training currently given by rehabilitation centre is not evidence-based, but mainly based on own experiences. Therefore, the overall aim of our project is to develop an evidence-based training protocol for upper extremity prostheses, where we focus in particular on myoelectric prostheses.

But before an evidence-based training program can be developed, we first have to know how people learn to use their prosthesis. Therefore, the natural learning processes during learning have to be determined. Describing the changes in movement characteristics over learning gives us hints as to where we can focus on in developing the training protocol.

Study objective

To measure the natural learning processes that take place while learning to use a myoelectric prosthesis. The second objective is to compare the results with a study of the learning processes in able-bodied participants who learn to use a myoelectric prosthetic simulator

Study design

Case studies

Intervention

Next to the regular occupational therapy the patients receive in the UMCG, they train during 5 sessions also in the laboratory. During these sessions they train direct grasping, indirect grasping and fixating with their prosthesis. The training will be used to register the improvements in the use of the prosthesis.

Study burden and risks

The experiment is non-invasive. During 5 laboratory sessions, embedded in the regular occupational therapy, the improvements of the patients will me measured. The risks associated with participation can be considered negligible.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Recently, transradial amputated
Novice prosthetic user

Exclusion criteria

Neurological problems concerning upper extremity or torso
Motor problems concerning upper extremity or torso
Earlier experience with a prosthesis

Study design

Design

Study type: Interventional

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	11-08-2009
Enrollment:	2
Type:	Actual

Ethics review

Approved WMO

Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL28427.042.09