Vibrational stimulation on the skin to provide feedback about the grasping force or hand opening of forearm prostheses during daily life grasping tasks.

No registrations found.

Ethical review	Not applicable
Status	Pending
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON20497

Source
NTR

Brief title
Myopro feedback 2

Health condition

forearm amputation - amputatie van de onderarm
congenital defect of the forearm - aangeboren gemis van de onderarm
myoelectric forearm prosthesis - myoelektrische onderarmprothese

Sponsors and support

Primary sponsor: University of Twente
Source(s) of monetary or material Support: Ministry of Economic Affairs, PIDON (Pieken in de Delta Oost Nederland)

Intervention

Outcome measures

Primary outcome

The performance in the grasping tasks, expressed in:

1. The time needed to perform the tasks;

2. The success in grasping (percentage objects grasped without slippage or breakage);

3. The Index of Functionality (IoF), the main outcome measure of the SHAP test.

Secondary outcome

1. The number of trials needed to successfully hold the object;

2. The force safety marging (difference between the required and the applied grasping force);

3. The percentage correcly identified objects (indication of object stiffness, size and weight).

Study description

Background summary

Sensory feedback about grasping force and hand opening of a myoelectric forearm prosthesis is very important in optimal object handling, but lacking in current commercial prostheses. We have developed and evaluated methods to provide hand opening and grasping force feedback via vibrotactile stimulation to the skin. However, virtual environments were used in the previous studies. Therefore, in this study the concepts for vibrotactile hand opening and grasping force feedback will be evaluated in daily life grasping tasks. Three kinds of grasping taks will be performed: 1) daily life grasping tasks within the standardized SHAP protocol, 2) grasping of delicate daily life objects and 3) grasping of abstract objects with varying weights, sizes and stiffness.

Study objective

Grasping performance of daily life grasping tasks will be improved when vibrotactile feedback about the hand opening and grasping force is provided compared to situations without vibrotactile and visual feedback.

Study design

All measurements will be performed on 1 day. For the patient measurements, a user specific

prosthesis socket will be made at least one week before the experiments.

Intervention

All subjects will be asked to perform grasping tasks (1-within a standardized protcol using the SHAP test, 2-grasping of delicate daily life objects, 3-grasping of abstract objects varying in weight, size and stiffness). All tasks are being performed with a commercial myoelectric forearm prosthesis, controlled by muscle activity (EMG) from the forearm (stump). During these tasks, vibrotactile feedback about the grasping force and the hand opening of the prosthesis is provided through a single vibrating element (C2 tactor) and an array of 8 coin motors respectively.

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Eligibility criteria

Inclusion criteria

1. Age between 18 and 65 years;

2. Able to control the experimental setup;

3. Forearm circumference between 24 and 28 cm (healthy subjects);

4. Forearm stump of at least 8 cm (patients);

5. Myoelectric prosthesis user (patients).

Exclusion criteria

1. Self-reported diminished sense of touch (healthy subjects);

2. Experience with vibrotactile stimulation (healthy subjects);

3. Experience with EMG control of a prosthesis or other device (healthy subjects);

4. Extreme skin problems at the forearm;

5. Mental problems;

6. Hypersensitivity of the skin of the stump (patients).

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Allocation:	Non controlled trial
Masking:	Open (masking not used)
Control:	N/A , unknown

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-05-2013
Enrollment:	20
Type:	Anticipated

Ethics review

Not applicable
Application type: Not applicable

Study registrations

Followed up by the following (possibly more current) registration

ID: 38759
Bron: ToetsingOnline
Titel:

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

No registrations found.

In other registers

Register	ID
NTR-new	NL3745
NTR-old	NTR3924
CCMO	NL44020.044.13
ISRCTN	ISRCTN wordt niet meer aangevraagd.
OMON	NL-OMON38759

Study results

Summary results
N/A