Influence of different types of feedback for learning to control grip force with a myo-electric prosthetic simulator

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The main objective of the study is to determine what type of feedback facilitates learning to control the grip force of a myo-electric hand.

Ethical review	Approved WMO
Status	Completed
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON37201

Source
ToetsingOnline

Brief title
Force control with a myo-electric simulator

Condition

- Other condition

Synonym
arm disability, upper limb amputation

Health condition

onderarmamputatie

Research involving
Human

Sponsors and support

Primary sponsor: Rijksuniversiteit Groningen
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: feedback, force control, TNC method, upper limb prosthesis

Outcome measures

Primary outcome

Test: mean deviations of the produced force in respect to the asked force value

for each test individually within the pretest, posttest and retentiontest

Training: distance from the landed ball to the target (error), and the

contribution of the Tolerance, Noise, and Covariation by means of the

TNC-method.

Secondary outcome

not applicable

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. However, 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, the overall use of prostheses will be enhanced. Currently, prosthetic training in rehabilitation centre is not evidence-based but mainly based on own experiences. In this study we will focus on a specific part of a training, the feedback one has to receive to learn to use the prosthesis as good as possible During this study, the focus of learning is on the force control of a

myo-electric prosthesis.

Study objective

The main objective of the study is to determine what type of feedback facilitates learning to control the grip force of a myo-electric hand.

Study design

pre-test/post-test intervention

Intervention

One group receives feedback in the form of knowledge of results and the other group will receive feedback in the form of knowledge of performance. The training is based on the app 'Angry Birds'. On a screen, a ball and goal are showed, the ball is atached to a spring. The purpose is to get the ball into the goal. This is done by determining a force and angle by elongating and moving the spring. The spring is elongated by producing force on a handle with the prosthetic hand. The angle is determined by moving the handle in the left/right direction. In this way the ball can be released to reach the goal.

Study burden and risks

The experiment is non-therapeutic, the participants have to learn grip force control with a prosthetic simulator during 5 training sessions. Five tests will be administered before the first training, after the last training and during a retention test after 2 weeks to assess the grip force control. The measurements are non-invasive. Therefore, the risks associated with participation can be considered negligible and the burden can be considered minimal. In this early stage of discovering force control processes we do not want to bother the few patients who have just been amputated. Therefore, we will use prosthetic simulators, which mimic real prosthetic devices and can be worn over a sound arm. With the use of the simulators we can also test more participants than only the few recently amputated patients.

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

right handed
normal or corrected to normal sight

Exclusion criteria

experience with a prosthetic simulator

Study design

Design

Study type: Interventional

Masking:	Single blinded (masking used)
Control:	Uncontrolled
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Completed
Start date (anticipated):	03-09-2012
Enrollment:	32
Type:	Actual

Ethics review

Approved WMO

Date:	13-07-2012
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

ID: 20324
Source: NTR
Title:

In other registers

Register	ID
CCMO	NL40721.042.12
OMON	NL-OMON20324