Virtual training of the myosignal

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Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON37573

Source
ToetsingOnline

Brief title
Virtual training of the myosignal

Condition

- Other condition

Synonym
arm disability, upper limb amputation

Health condition

onderarm amputatie

Research involving
Human

Sponsors and support

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

Intervention

Keyword: learning, myocontrol, upper limb prosthesis, virtual training

Outcome measures

Primary outcome

From the discrete test, the range of velocities at which the virtual hand is opened and closed during both pre- and posttest is used to determine the level and improvement of discrete myocontrol. In the continuous test the difference between the myosignals and the target patterns (the patterns that participants had to match their myosignal levels to) are used as outcome measures to determine the level and improvement of the participants* continuous myocontrol ability.

Secondary outcome

Dexterity tests: time to complete the pinboard task (mABC2), force production assessments on the grip force task and scores on the Fitts' task will be used to test prediction of myocontrol learning ability.

Hand dominance: the interaction effect between hand dominance and virtual training method will be used to determine whether the dominant and non-dominant hand differ in the training method which has the best effect.

Study description

Background summary

Myocontrol is the control of an external device through EMG signals produced by the muscles (the myosignals) and is used in myoelectric arm and hand

prostheses. Modern prostheses require a high level of myocontrol. Hence, knowledge about characteristics of training that improve myocontrol might be helpful for amputees to increase their control of these prostheses. Conventional training involves actual prostheses, but virtual training methods could provide the same results, as improvements in myocontrol have been shown using virtual training methods (e.g. Radhakrishnan et al. 2008, Perez-Maldona et al. 2010, Bouwsema et al. 2010). Furthermore, virtual training methods have multiple benefits over training myocontrol with an actual prosthesis, as they are easy to apply and use, low in cost and allow for training and testing of an amputees* myocontrol ability before acquiring an actual prosthesis. Although virtual training methods have been shown to produce positive effects on myocontrol, it is currently unknown which type of virtual training method has the best result. Therefore this study examines different virtual training methods on their effects on myocontrol.

Study objective

The main objective of the study is to investigate which type of virtual training has the highest impact on learning myocontrol.
Secondary objectives are to investigate whether the progress in a participants* myocontrol can be predicted by his or her scores on three manual dexterity tasks, and to examine whether the dominant and the non-dominant hand differ in the type of training that has the best result.

Study design

pre-test/post-test intervention

Intervention

One group will train myocontrol with their produced myosignal as instantaneous feedback. The second will train using a virtual myoelectric hand and the third group will train using a videogame. All groups will be trained on three consecutive days.

Study burden and risks

The myosignal will be measured with the same electrodes as are used in standard myoelectric prostheses. Hence, essentially the tasks in the experiment are comparable to handling a prosthesis. With regard to the load of the tasks, participants train myocontrol for three consecutive days and tests will be performed on day one and three. Moreover, at the start of day one and at the end of day three, three non-invasive manual dexterity tests will be administered. Each day the session will take less than one hour. There are no risks associated with participation.

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:	Recruitment stopped
Start date (anticipated):	03-12-2012
Enrollment:	36
Type:	Actual

Ethics review

Approved WMO

Date:	20-11-2012
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

No registrations found.

In other registers

Register	ID
CCMO	NL39792.042.12