Transfer from a serious game developed to train multi-articulated prosthesis use to actual multi-articulated prosthesis use.

No registrations found.

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

Summary

ID

NL-OMON24876

Source
NTR

Health condition

Healthy volunteers, amputees, upper limb prosthesis

Sponsors and support

Primary sponsor: University Campus Fryslan, Revalidatiefonds Nederland
Source(s) of monetary or material Support: University Campus Fryslan, Revalidatiefonds Nederland

Intervention

Outcome measures

Primary outcome

Primary outcome measure per test part;

Serious game:

Proportional: the error between required and produced velocity and the difference between the aperture of the virtual gripper and the diameter of three differently sized virtual balls.

Discrete: Number of unsuccessful and successful switches, time needed to produce switch, and the type of command signal used to switch (hold-open, co-contraction, double puls).

Displayed EMG signal:

Proportional: The velocities of the left/right movement of a virtual platform at three different speeds (slow, intermediate and fast). The angle of the regression line through the three velocities will be determined.

Discrete: Number of unsuccessful and successful switches. Time needed to produce switch.

Prosthesis task: Duration of correctly re-placing a set of 6 clothespins.

Primary outcome measure for pre- and posttest;

Duration of correctly re-placing a set of 6 clothespins.

Secondary outcome

Secondary outcome measures;

Serious game:

Proportional: Duration of the plateau phase of the aperture of the gripper in the game. Accuracy of catching. Number of broken/missed/bounced objects.

Discrete: x

Displayed EMG signal:

Proportional: x

Discrete: time needed to produce switch.

Prosthesis task:

Proportional: Plateau time of hand opening

Discrete: Number of unsuccessful and successful switches.

All the above described measures will be ranked over participants per test. These ranks will be analyzed.

Study description

Study objective

The current study focusses on 1) transfer of a skill trained in two virtual environments with different feedback on actual performance to performance with a myoelectrically controlled hand prosthesis, 2) comparing the ability of switching with the ability to proportionally control the signal after a period of training, 3) establish whether individual differences show up in switching ability.

Study design

All subjects will be measured on 5 consecutive days (Monday-Friday). The pretest will be done at day one, the posttest on day 5. The training days will be on day 1, 2, 3, 4 and 5.

The primary results are based on times and distances. These measures are all based on data collected from the avatar that is displayed on the screen, the EMG data collected during the second task and the data collected from the prosthesis hand.

Intervention

This study is set up with a pre- posttest design with a 5 day training period in between. The participants will be divided into four groups. Depending on the group they will train with either a serious game mimicking a virtual reality setting, a displayed EMG signal on a screen, or a prosthesis simulator. All three devices are controlled using surface EMG measured on the flexor and extensor of the wrist. The fourth group will train with the serious game of the first group but this game will now be controlled using a computer keyboard and touchpad.

Per day all training sessions will take 15 minutes. During the pre- and posttest all subjects

will perform a Clothespin task executed with a prosthesis simulator.

Contacts

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Eligibility criteria

Inclusion criteria

The subjects included in this study are able bodied and right handed, with normal or corrected to normal vision. Both male and female subject will be included. All subjects included will be between 18 and 50 years of age.

Exclusion criteria

Subjects with (history of) pain or musculoskeletal impairments of the arms or upper body will not be included. The same accounts for subjects with prior experience in the use of myoelectric devices and subjects younger than 18 or older than 50.

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Allocation:	Non controlled trial
Masking:	Single blinded (masking used)
Control:	Active

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	03-04-2017
Enrollment:	40
Type:	Anticipated

Ethics review

Not applicable

Application type:	Not applicable

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
NTR-new	NL6006
NTR-old	NTR6504
Other	ECB : 2014.02.28_1

Study results