Development of handrim wheelchair propulsion technique in the context of shoulder overload and daily activity during spinal cord injury rehabilitation: a pilot study*

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To monitor and describe the natural motor learning of handrim wheelchair propulsion during usual care in a Dutch spinal cord injury rehabilitation center. Motor learning is operationalized as change in mechanical efficiency, propulsion technique and...

Ethical review	Approved WMO
Status	Completed
Health condition type	Spinal cord and nerve root disorders
Study type	Observational non invasive

Summary

ID

NL-OMON43255

Source
ToetsingOnline

Brief title
Wheelchair propulsion: you need to learn it

Condition

- Spinal cord and nerve root disorders

Synonym
spinal cord injury

Research involving
Human

Sponsors and support

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

Intervention

Keyword: daily activity, efficiency, shoulder pain, wheelchair motor learning

Outcome measures

Primary outcome

The primary study parameter is the mechanical efficiency (ratio of power output and energy expenditure)

Secondary outcome

The secondary study parameters include: propulsion technique variables, peak exercise capacity (VO2 max, heart rate, RPE), shoulder load during submaximal exercise testing, daily wheelchair activity measured with accelerometers , score on the wheelchair skill tests, outcomes of the questionnaires, maximal isometric force.

Study description

Background summary

Wheelchair dependency is a result of disease or trauma that irreversibly impairs the ability to walk. Handrim wheelchair propulsion provides freedom of mobility but also contributes to shoulder overuse injuries and pain which can potentially lead to an inactive lifestyle. It is hypothesized that a proper propulsion technique helps to prevent some of the strain resulting from wheelchair use. Evidence-based guidelines for practice protocols that would enhance the motor learning process and minimize the injury risk are missing since the learning process of wheelchair propulsion in the early stages of rehabilitation is unknown.

Study objective

To monitor and describe the natural motor learning of handrim wheelchair propulsion during usual care in a Dutch spinal cord injury rehabilitation center. Motor learning is operationalized as change in mechanical efficiency, propulsion technique and level of wheelchair-related skills over time.

Study design

Prospective longitudinal cohort pilot study to monitor and describe the learning process of 15 wheelchair-dependent participants with recent spinal cord injury. Additionally, 15 experienced wheelchair users with chronic spinal cord injury will be tested cross-sectionally in order to compare the outcomes of the wheelchair motor learning process on a short and long term comparing unexperienced and experienced wheelchair users.

Study burden and risks

During usual care, the longitudinal cohort study participants (N=15) will participate in a total of 8 measurement occasions. First six measurements will take place once a week over first 6 weeks of in-patient active rehabilitation. Last two measurements will take place at discharge and shortly after discharge from the rehabilitation center. This last measurement will take place at the Center for Human Movement Sciences lab. The cross-sectional participants (N=15) will be asked to come to the rehabilitation centre for one measurement and to the Center for Human Movement Sciences lab for one measurement. At both laboratory sites (rehabilitation centre Beatrixoord and Center for Human Movement Sciences lab) an emergency crash procedure is available throughout the organization and during testing. The test battery proposed in this protocol was also used in previous projects on very similar groups of participants and no adverse events were reported. The risks during testing sessions are relatively low because of thorough screening by the rehabilitation physician prior to participation and safety precautions throughout testing. Testing in itself brings low risk since the activities performed by the participant are similar to the regular daily activity during usual care in the rehabilitation center. The expected beneficial effects, including better monitoring of the wheelchair motor learning process and gaining information necessary to construct the evidence-based guidelines, in combination with the limited risks would clearly justify the proposed study.

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

* Spinal cord injury
* Expected manual wheelchair dependency
* Age between 18 * 65 years
* Recent spinal cord injury (for the longitudinal group)
* Time since spinal cord injury > 2 year (for the experienced participants)

Exclusion criteria

* Cardiovascular contra-indications for testing according to the American College of Sports Medicine (ACSM) guidelines (ACSM, 1998), or a resting diastolic blood pressure above 90 mm Hg or a resting systolic blood pressure above 180 mm Hg
* Insufficient knowledge of Dutch language to understand the test instructions
* Progressive disease e.g. cancer or multiple sclerose
* Psychiatric problem
* Pregnancy

Study design

Design

Study type: Observational non invasive

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

Recruitment

NL

Recruitment status:	Completed
Start date (anticipated):	23-09-2016
Enrollment:	30
Type:	Actual

Ethics review

Approved WMO

Date:	11-07-2016
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: 20592
Source: Nationaal Trial Register
Title:

In other registers

Register	ID
CCMO	NL57063.042.16
OMON	NL-OMON20592