# Shoulder load and daily activities compared between power assisted and manual wheelchair propulsion.

No registrations found.

**Ethical review** Positive opinion

**Status** Pending

Health condition type -

**Study type** Interventional

# **Summary**

#### ID

NL-OMON27067

#### **Source**

Nationaal Trial Register

#### **Health condition**

Manual wheelchair users with upper limb impairments or upper limb complaints. Manuele rolstoel gebruikers met beperkte arm-hand functie of aandoeningen aan de bovenste extremiteit.

# **Sponsors and support**

**Primary sponsor:** Roessingh Research and Development b.v. **Source(s) of monetary or material Support:** Supported by INTERREG The Netherlands and Germany (European Regional Development Fund of the European Union), grant 34 Interreg IV A.

## Intervention

#### **Outcome measures**

#### **Primary outcome**

To assess if the forces and moments acting on the shoulder are lower during power assisted wheelchair propulsion compared to manual wheelchair propulsion, related to perceived load

1 - Shoulder load and daily activities compared between power assisted and manual wh ... 30-05-2025

of the upper extremity (VAS-score) and objectively measured with the oxygen uptake within six minutes.

#### **Secondary outcome**

To determine the differences between power assisted wheelchair and manual wheelchair propulsion on the three levels of the ICF model:

1. ICF: Body functions and structure:

A. Is the intensity, frequency and influence of shoulder pain on daily activities different during four weeks of power assisted wheelchair use compared to four weeks of manual wheelchair use?

2. ICF: Activity:

A. Is the use of a wheelchair during a day (travelled distance, time, and velocity) different during four weeks power assisted wheelchair use compared to four weeks manual wheelchair use?

B. Are wheelchair skills influenced by the power assisted wheelchair, compared to the manual wheelchair?

3. ICF: Participation:

A. Is community participation and self efficacy different during four weeks power assisted wheelchair use compared to four weeks manual wheelchair use?

B. Are the participants satisfied with the power assisted wheelchair?

# **Study description**

## **Background summary**

Objective:

The primary objective is to compare forces and moments acting on the shoulder of manual wheelchair users during power assisted wheelchair propulsion and manual wheelchair propulsion.

The secondary objectives are to assess the differences between power assist wheelchair propulsion and manual wheelchair propulsion on (a) the intensity and frequency of shoulder pain, (b) activity during a day, (c) community participation and quality of life.

2 - Shoulder load and daily activities compared between power assisted and manual wh ... 30-05-2025

Study design:
This study is a longitudinal experimental study.
Study population:
20 manual wheelchair users.
Intervention:
The applied intervention is a set of power assist wheels which are placed on participants own manual wheelchair. During one measurement an instrumented wheelchair with a force and torque sensor in the wheel axis is used.
Main study parameters/endpoints:
Main study parameter is shoulder load. Secondary study parameters were intensity and

## Study objective

assisted wheelchair.

Because the force needed to propel the wheelchair is partly delivered by a motor, we hypothesized that the forces and moments exerted on the rim will decrease. Consequently, forces and moments at the glenohumeral joint and muscle activation of push phase muscles will decrease. Less contact time on the rim will be necessary to generate enough torque to propel the wheelchair, which will result in a lower propulsion frequency and smaller glenohumeral joint angles. In addition wheelchair propulsion requires less effort with power assist which will result in a longer distance travelled and more involvements in social activities.

frequency of shoulder pain; distance, velocity and time daily travelled; wheelchair skills; energy expenditure; community participation, and quality of life; opinion about the power

## Study design

4 weeks of own manual wheelchair use and 4 weeks power assisted wheelchair use:

- 1. Intensity and frequency of shoulder pain (daily VAS);
- 2. Daily time and distance travelled (registered by means of a reedcontact);

- 3. Performed activities (daily questionnaire); Measurements at Roessingh Research and Development (RRD):
- A. Shoulder load;
- B. Biomechanical analysis upper extremity; Force and torque sensor at the wheelaxis;
- C. Wheelchair skills test;
- D. Questionnaires: WUSPI, SEWMS, D-QUEST.

#### Intervention

The applied intervention is a set of power assist wheels which we place on the participants own manual wheelchair for four weeks.

## **Contacts**

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# **Eligibility criteria**

## Inclusion criteria

- 1. Manual wheelchair user for at least one year due to a neurological disorder;
- 2. Medically and physically stable, judged by subjects own physician;
  - 4 Shoulder load and daily activities compared between power assisted and manual wh ... 30-05-2025

- 3. The upper limbs might be affected; however, they should be able to propel a manual wheelchair bimanually;
- 4. Able to maintain posture (trunk stability);
- 5. Age 18 to 65;
- 6. Subjects should be able to use their usual mode of transportation with the power assisted wheels;
- 7. Their wheelchair fitted with power assist wheels.

## **Exclusion criteria**

- 1. Use of any type of power assisted wheelchairs;
- 2. Extreme shoulder pain, contractures upper extremity and/or spasticity which made manual wheelchair propulsion for the duration of the measurements impossible;
- 3. Cognitive or communicative impairments which made cooperation with the study protocol compromised.

# Study design

# Design

Study type: Interventional

Intervention model: Parallel

Allocation: Non controlled trial

Masking: Open (masking not used)

Control: Active

#### Recruitment

NL

Recruitment status: Pending

Start date (anticipated): 01-05-2011

Enrollment: 20

Type: Anticipated

# **Ethics review**

Positive opinion

Date: 21-12-2010

Application type: First submission

# **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 NL2543 NTR-old NTR2661

Other Euregio: 7936 MIAS AAD

ISRCTN wordt niet meer aangevraagd.

# **Study results**

## **Summary results**

N/A