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

Published: 21-04-2011 Last updated: 27-04-2024

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 and the perceived upper extremity load. The secondary objectives...

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

# Summary

### ID

NL-OMON36243

**Source** ToetsingOnline

**Brief title** Effect of power assisted wheelchair propulsion.

### Condition

- Other condition
- Neuromuscular disorders

**Synonym** Manual wheelchair users, subjects with a neurological disorder

#### **Health condition**

Manuele rolstoel gebruikers

#### **Research involving**

Human

1 - Shoulder load and daily activities compared between power assisted and manual wh ... 13-05-2025

### **Sponsors and support**

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

#### Intervention

Keyword: Activities, Power assisted wheelchair, Shoulder load, Wheelchair

#### **Outcome measures**

#### **Primary outcome**

Main study parameter is shoulder load (perceived shoulder load and objectively

measured load).

#### Secondary outcome

Secondary study parameters are intensity, frequency and influence on daily

activities of shoulder pain; distance, velocity and time daily travelled;

wheelchair skills; energy expenditure; community participation, self-esteem and

user satisfaction.

# **Study description**

#### **Background summary**

Manual wheelchair users rely extensively on their upper extremities for mobility. Unfortunately, upper extremity complaints among wheelchair users are a common problem. Work requirements of manual wheelchair propulsion that have been linked to shoulder injuries are the repetitive (high) forces and moments at the shoulder, extremes of motion during propulsion and muscular imbalance. A power assisted wheelchair can be useful to decrease the workload, thereby possibly reducing the risk on developing shoulder injuries. However, no previous research has been published about the influence of power assisted propulsion on forces and moments exerted on the rim and acting on the shoulder. Therefore this is our primary goal. Because the force needed to propel the wheelchair is partly delivered by a motor, we hypothesize that the forces and moments exerted on the rim will decrease. Consequently, forces and moments at the glenohumeral joint and muscle activation amplitude of push phase muscles will decrease. Because, the transition to another type of wheelchair will influence subjects in a broader perspective than only upper extremity function. When a subject has less shoulder complaints or wheelchair propulsion costs less energy, the activity level and participation in social activities can increase. Because of this we will also investigate the differences on activity and participation between manual and power assisted wheelchair propulsion.

#### **Study 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 and the perceived upper extremity load. The secondary objectives are to assess the differences between power assisted wheelchair propulsion and manual wheelchair propulsion on (a) the intensity and frequency of shoulder pain, and the influence of shoulder pain on daily activities, (b) activity during a day and wheelchair skills, (c) self efficacy and user satisfaction.

#### Study design

This study is a longitudinal intervention study with a cross-over design.

#### Intervention

Power assisted wheels mounted on their own wheelchair frame.

#### Study burden and risks

Turns are easier in a power assisted wheelchair. By accidental means the displacement of the wheelchair might be larger than expected, so people can collide with obstacles in the environment. The power assist wheels are heavier which might give problems in car transfers.

# Contacts

#### **Public** Roessingh Research and Development

Roessinghsbleekweg 33b 7522 AH Enschede NL Scientific

Roessingh Research and Development

3 - Shoulder load and daily activities compared between power assisted and manual wh ... 13-05-2025

Roessinghsbleekweg 33b 7522 AH Enschede NL

# **Trial sites**

### **Listed location countries**

Netherlands

# **Eligibility criteria**

Age

Adults (18-64 years) Elderly (65 years and older)

### **Inclusion criteria**

- Manual wheelchair user for at least one year due to a neurological disorder.
- The subjects should be able to propel a manual wheelchair bimanually.
- Medically and physically stable, judged by subjects own rehabilitation physician.
- Sufficient trunk stability to maintain posture.

• Age 18 or older.

• Subjects should be able to use their usual mode of transportation with the power assisted wheels.

• The power assist wheels should fit on the subjects own wheelchair frame.

# **Exclusion criteria**

- Use of any type of PAPAW.

- Extreme shoulder pain, contractures upper extremity and/or spasticity which made manual wheelchair propulsion for the duration of the measurements impossible.

- Cognitive or communicative impairments which made cooperation with the study protocol compromised.

# Study design

# Design

Study type:	Interventional
Intervention model:	Crossover
Allocation:	Randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Other

### Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	05-07-2011
Enrollment:	20
Туре:	Actual

# Medical products/devices used

Generic name:	Power assisted wheelchair
Registration:	No

# **Ethics review**

Approved WMO Date:	21-04-2011
Application type:	First submission
Review commission:	METC Twente (Enschede)
Approved WMO Date:	27-03-2012
Application type:	Amendment
Review commission:	METC Twente (Enschede)

# **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 CCMO **ID** NL35398.044.11