# Muscle function in relation to daily activity patterns of the upper and lower extremities in COPD patients.

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Primary objective:Test whether preservation of upper limb compared to lower limb muscle function is associated with preservation of functional arm use compared to functional leg use in daily life in patients with COPD compared to healthy controls....

Ethical review	Approved WMO
Status	Pending
Health condition type	Bronchial disorders (excl neoplasms)
Study type	Observational non invasive

# Summary

### ID

NL-OMON36511

**Source** ToetsingOnline

#### **Brief title**

The relation between muscle function and daily activity in COPD patients.

# Condition

• Bronchial disorders (excl neoplasms)

#### Synonym

chronic obstructive pulmonary disease

#### **Research involving** Human

### **Sponsors and support**

**Primary sponsor:** Medisch Universitair Ziekenhuis Maastricht **Source(s) of monetary or material Support:** Ministerie van OC&W

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### Intervention

Keyword: Daily activity, Endurance, Strength

#### **Outcome measures**

#### **Primary outcome**

m. biceps brachii and m. quadriceps femoris strength and endurance

Daily arm and leg use

#### Secondary outcome

Median frequency of the EMG signal

Date of birth, gender, weight, body length, lung function.

# **Study description**

#### **Background summary**

Physical inactivity in healthy subjects increases the risk of developing a number of chronic diseases, such as chronic obstructive pulmonary disease (COPD). Indeed, physical inactivity is one of the lifestyle-related health determinants. Therefore, guidelines recommend that a minimum of 30 minutes of daily physical activity of moderate intensity is necessary to maintain physical fitness, and those not meeting this standard are considered insufficiently active.

Decreased activity in daily life is likely to play a key role in the development and progression of skeletal muscle weakness and a poor exercise performance in patients with COPD. Indeed, a \*downward disease spiral\* has been hypothesized, in which advancing dyspnoea leads to a sedentary lifestyle and de-conditioning of the muscles, and thus further daily physical inactivity. Exercise-based pulmonary rehabilitation programs have been shown to effectively improve quality of life, muscle function and exercise capacity in patients with COPD which cannot be attributed to changes in forced expiratory volume in the first second (FEV1). Moreover, studies of skeletal muscle impairment in COPD have demonstrated that upper limb muscles were less affected than lower limb muscles (strength, endurance and exercise capacity). It is unknown whether and to what extent differences in muscle dysfunction between arm and leg muscles reflect a difference in their daily use or an innate difference in the susceptibility to disease.

To evaluate whether and to what extent differences in muscle dysfunction between arm and leg muscles in COPD patients reflect a difference in their daily use, daily physical activity in relation to muscle function needs to be assessed. At present, a wide range of test models and protocols is being used for quantification of muscle strength and endurance in COPD patients. To minimise the impact of the muscle contractions on the cardiopulmonary systems (which is limited in COPD patients compared to healthy controls), an endurance protocol based on localised isometric contractions will be used. For the assessment of daily arm and leg activity, two wearable unobtrusive sensors will be used which provide information on motion intensity, duration (sec.) and orientation of the upper arm and leg. It is hypothesized that preservation of upper limb compared to lower limb muscle function is associated with preservation of functional arm use compared to functional leg use in daily life in patients with COPD compared to healthy controls.

#### Study objective

Primary objective:

Test whether preservation of upper limb compared to lower limb muscle function is associated with preservation of functional arm use compared to functional leg use in daily life in patients with COPD compared to healthy controls.

Secondary objectives:

- Compare the ratio of the m. biceps brachii and m. quadriceps femoris strength and endurance between COPD patients and healthy controls

- Compare the development of muscle fatigue during the endurance test between COPD patients and healthy subjects.

- Compare the ratio of the daily arm and leg use between COPD patients and healthy controls.

- Compare the duration of active periods between COPD patients and healthy subjects

### Study design

This is a Case-control study. Muscle strength and endurance will be measured. Furthermore daily activity patterns will be measured for 5 days.

### Study burden and risks

Not applicable

# Contacts

#### Public

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# **Trial sites**

# **Listed location countries**

Netherlands

# **Eligibility criteria**

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

### **Inclusion criteria**

- Volunteers willing to participate and fully competent
- Able to walk (either with or without walking aids)
- Patients need to be clinically stable

# **Exclusion criteria**

- Unable to walk

# Study design

# Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Diagnostic

# Recruitment

NL	
Recruitment status:	Pending
Start date (anticipated):	01-02-2011
Enrollment:	60
Туре:	Anticipated

# **Ethics review**

Approved WMO	
Date:	07-02-2011
Application type:	First submission
Review commission:	METC academisch ziekenhuis Maastricht/Universiteit Maastricht, METC azM/UM (Maastricht)

# **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.

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# In other registers

# Register

ССМО

**ID** NL34971.068.10