# Accelerometry as a Measure of Physical Activity and Inactivity in Children with Chronic Disease

Published: 04-03-2008
Last updated: 10-08-2024

1. To detrrmine the applicability of standard energy expenditure prediction equations for accelerometry in measuring physical activity in children with musculoskeletal and other chronic diseases (see below).2. To develop disease specific prediction...

| | |
|---|---|
| **Ethical review** | Approved WMO |
| **Status** | Recruitment stopped |
| **Health condition type** | Congenital cardiac disorders |
| **Study type** | Observational non invasive |

## Summary

### ID

NL-OMON31780

**Source**
ToetsingOnline

**Brief title**
Accelerometry in Chronic Illness

### Condition

- Congenital cardiac disorders
- Joint disorders
- Neuromuscular disorders

**Synonym**
chronic illness

**Research involving**
Human

### Sponsors and support

**Primary sponsor:** Universitair Medisch Centrum Utrecht

**Source(s) of monetary or material Support:** Canadian Institute for Health Research

## Intervention

**Keyword:** accelerometry, energy expenditure, oxygen uptake, physical activity

## Outcome measures

### Primary outcome

The main study parameter is the agreement between predicted energy expenditure from accelerometry counts compared to directly measured energy expenditure via metabolic cart.

### Secondary outcome

We will begin to develop disease specific prediction equations - where necessary - to determine the relationship between accelerometry counts and energy expenditure in these groups.

We will compare 2 different accelerometers (Actical with Actigraph) to determine if one is superior in predicting energy expenditure compared to the other.

# Study description

### Background summary

This pilot study will provide tools with which to better study the interaction between physical activity and musculoskeletal disease in children. Habitual physical activity may play an important role in the prevention or attenuation of chronic disease. Assessment of physical activity can be used to determine disease specific rehabilitation programs and to measure outcomes in research interventions. Accelerometry, a measure of physical activity, has been shown to be valid and reliable way to characterize physical activity patterns in healthy children but may not be valid in chronic disease. The applicability of

accelerometry must be determined in children with chronic disease.

**Study objective**

1. To detrrmine the applicability of standard energy expenditure prediction equations for accelerometry in measuring physical activity in children with musculoskeletal and other chronic diseases (see below).

2. To develop disease specific prediction equations - where necessary - to determine the relationship between accelerometry counts and energy expenditure for each of these groups of children.

3. To compare the applicability of unidirectional (vertical) and omni-directional (all directions) accelerometers in predicting energy expenditure.

**Study design**

This is an observational study in which children will participate in a single exercise testing session at SickKids or UMC. Energy expenditure measured via expired gas using a metabolic cart and accelerometry counts will be determined for each subject while completing two exercise protocols. Exercise protocol: Children will participate in two treadmill walking tasks followed by a jogging task at a self-selected pace. Activities of daily living protocol: Each participant will engage in 7 minutes each of playing video games while seated, a cleaning task (sweeping), two jumping tasks, and a stair-stepping routine. These protocols represent the spectrum of intensity range of activities that a child might engage in during a typical day. Other measures include heart-rate monitoring, self-report physical function and health-related quality of life and assessments of pain using 10cm visual analog scales.

**Study burden and risks**

Participants will be asked to take part in one exercise testing session that will last approximately 2.5 hours. They will be asked to participate in several exercise tasks, several daily living tasks, and will be asked to fill in 4 questionnaires. The level of discomfort should be minimal as all of these tasks are safe for children to perform. They may experience some muscle soreness or stiffness, but this should not worsen their disease or disability.

# Contacts

**Public**
Universitair Medisch Centrum Utrecht

postbus 85090
3508 AB
Nederland
**Scientific**
Universitair Medisch Centrum Utrecht

postbus 85090
3508 AB
Nederland

# Trial sites

## Listed location countries

Netherlands

# Eligibility criteria

**Age**
Adolescents (12-15 years)
Adolescents (16-17 years)
Children (2-11 years)

## Inclusion criteria

Age 8 to 18 years.
Both prepubescent and pubescent children will be enrolled.
• Healthy controls - will include any child without a history of disease or disability who are able to cooperate with the testing procedures.
• Diagnosis of Juvenile Idiopathic Arthritis (JIA) - based on the ILAR criteria (56) OR
• Diagnosis of Severe Hemophilia A or B (< 1% clotting factor activity) OR
• Diagnosis of Juvenile Dermatomyositis (JDM) - based on the Bohan & Peter criteria OR
• Diagnosis of dystrophinopathy (Beckers, Duchenne*s) or other inherited muscle disease OR
• Diagnosis of Cerebral Palsy (Gross Motor Function Classification system Levels I or II) (57) OR
• Diagnosis of Cystic Fibrosis OR
• Diagnosis of congenital heart disease (CHD) and Fontan procedure or tetralogy of Fallot repair.

### Exclusion criteria

Medical status that will not allow exercise testing
Medications that interfere with heart rate response to exercise
Non-ambulation: patients who are unable to ambulate
Insufficient understanding of the Dutch language in both children and parents
See also page 14 of the protocol

## Study design

### Design

**Study type:** Observational non invasive

| | |
|---|---|
| Masking: | Open (masking not used) |
| Control: | Uncontrolled |
| Primary purpose: | Prevention |

### Recruitment

NL

| | |
|---|---|
| Recruitment status: | Recruitment stopped |
| Start date (anticipated): | 25-03-2008 |
| Enrollment: | 80 |
| Type: | Actual |

## Ethics review

Approved WMO

| | |
|---|---|
| Date: | 04-03-2008 |
| Application type: | First submission |
| Review commission: | METC Universitair Medisch Centrum Utrecht (Utrecht) |

## 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 |
| --- | --- |
| CCMO | NL18035.041.07 |