

# EXERcise and changes in executive functions and pre-frontal BRAIN activity during walking

<b>Submission date</b> 13/12/2013	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
<b>Registration date</b> 11/03/2014	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 13/03/2014	<b>Condition category</b> Other	<input type="checkbox"/> Individual participant data <input type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

We are carrying out a study to test the effects of physical training with a video dance game on executive functions and frontal brain activity. Executive functions, a set of mental processes that helps connect past experience with present action, are used to perform activities such as planning, organizing, strategizing, paying attention to and remembering details. Our goal is to find the effects of the training programs on brain functions. The study's findings should help to improve the well-being of elderly and help prevent age-related changes in brain functioning.

### Who can participate?

Men and women, aged over 70 years and able to walk independently for 10 minutes.

### What does the study involve?

Participants will be randomly allocated to participate in one of two possible training programs. Group 1 receives a progressive dance video game training performed over 30 minutes, three times per week, on dance pads. The program lasts 8 weeks. Group 2 receives an intervention with progressive balance training and additional stretching exercises performed over 30 minutes, three times per week, on dance pads and the program lasts 8 weeks. At the beginning and end of the study, we will compare executive functioning and frontal brain activity while walking on a treadmill.

### What are the possible benefits and risks of participating?

There will be no immediate direct benefit to those taking part but there should be benefits to elderly people in the future because the results of the study are likely to influence how fall prevention training should be designed.

The main risk of training is getting an injury because of increasing the difficulty of the exercise too quickly.

### Where is the study run from?

The study has been set up by the Swiss Federal Institute of Technology in Zurich (Switzerland). Participants will be recruited in the city of St.Gallen, Switzerland and surrounding communities. Training intervention will take place in the Geriatrics Hospital St.Gallen.

When is the study starting and how long is it expected to run for?

Recruitment started in October 2013. Participants were enrolled on the study for a period of four months and the study completed in February 2014.

Who is funding the study?

Swiss Federal Institute of Technology (ETH) and Zurcher Kantonalbank (ZKB), Switzerland.

Who is the main contact?

Dr Eling D. de Bruin

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## Contact information

### Type(s)

Scientific

### Contact name

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## Additional identifiers

### Protocol serial number

EKSG 13/089

## Study information

### Scientific Title

Pre-frontal brain activity during walking and executive functions following training: a functional near-infrared spectroscopy (fNIRS) study

### Acronym

EXERBRAIN

### Study objectives

We hypothesize that the prefrontal cortex will show changes in activation properties following a video-exergame training intervention in elderly.

### Ethics approval required

Old ethics approval format

## **Ethics approval(s)**

The Medical Ethics Committee of the Canton St. Gallen, Switzerland (EKSG 13/089)

## **Study design**

Randomised controlled trial

## **Primary study design**

Interventional

## **Study type(s)**

Other

## **Health condition(s) or problem(s) studied**

Video-exergame training intervention in elderly

## **Interventions**

Participants are randomised to one of two groups:

Intervention Group: Receives a progressive dance video game training performed during 30 minutes, three times per week, on dance pads. The program lasts 8 weeks.

Control Group: Receives an intervention with progressive balance training and additional stretching exercises for the same time period and with an equal frequency and training duration.

## **Intervention Type**

Other

## **Phase**

Not Applicable

## **Primary outcome(s)**

Near-infrared spectroscopic (NIRS) imaging to assess bilateral increase of oxygenated hemoglobin (oxyHb) in the prefrontal cortex during treadmill walking

## **Key secondary outcome(s)**

1. Cognitive functioning (shifting, inhibition and updating): paper & pencil test / measured at baseline and three months
2. Short physical performance battery (SPPB): physical performance test / measured at baseline and three months

## **Completion date**

28/02/2014

# **Eligibility**

## **Key inclusion criteria**

1. Aged 65 years or older
2. Living independently or in a retirement home
3. Being able to walk 10 minutes without a break on a treadmill
4. Being healthy (self-reported)
5. Having given written informed consent

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Senior

**Sex**

All

**Key exclusion criteria**

1. Individuals who reported more than one serious health complaint (e.g. recent heart attack, uncontrolled diabetes or uncontrolled hypertension)
2. Individuals who reported diagnosis of Alzheimer's disease, dementia, or recent head injuries

**Date of first enrolment**

01/10/2013

**Date of final enrolment**

28/02/2014

**Locations****Countries of recruitment**

Switzerland

**Study participating centre**

Inst.f.Bewegungswissenschaften und Sport

Zurich

Switzerland

8093

**Sponsor information****Organisation**

Swiss Federal Institute of Technology in Zurich (ETHZ) (Switzerland)

**ROR**

<https://ror.org/05a28rw58>

**Funder(s)**

**Funder type**

University/education

**Funder Name**

Zurcher Kantonalbank (Switzerland) within the framework of sponsoring of movement sciences, sports and nutritional sciences at the Swiss Federal Institute of Technology in Zurich (ETHZ) (Switzerland)

**Results and Publications****Individual participant data (IPD) sharing plan****IPD sharing plan summary**

Not provided at time of registration