Age related adaptations in postural control after balance perturbations by simulating a *near fall*.

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To gain insight into factors that indicate an improved postural control by evaluating balance recovery (in terms of centre of mass (CoM) and centre of pressure (CoP)) of both young and older adults during a reaching task while exposed to...

Ethical review	Approved WMO
Status	Will not start
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON38827

Source
ToetsingOnline

Brief title
Postural control after balance perturbations.

Condition

- Other condition

Synonym
impaired postural control; fall risk

Health condition

leeftijdsgerelateerde veranderingen in de houdingscontrole

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen
Source(s) of monetary or material Support: SPRINT SNN tender

Intervention

Keyword: Balance, Fall prevention, Perturbations, Postural control

Outcome measures

Primary outcome

Age-related differences in postural control:

- Response types: in-place response or stepping response; single step,

multiple steps and *fall*

- Balance recovery in terms of bodily displacement: step length, step width,

presence of an APA (anticipatory postural adjustment), COM displacement, COP

displacement and accelerations.

- Balance recovery in terms of reaction times: onset latency (time to initial

response), time to foot-off, time to foot-contact

Secondary outcome

-Clinical Balance test: The Narrow Ridge Balance Test (NRBT) to assess balance

performance in elderly.

-The adapted Dutch version of the Incidental and Planned Exercise Questionnaire

(IPEQ) for older people to measure average weekly physical activity over the

past 3 months of the elderly.

Study description

Background summary

Falls are one of the greatest concerns among the elderly, because the incidents are high and they lead to severe consequences. The extent of the problem will continue to expand as the number of older people is expected to increase dramatically over the next few decades. An important risk factor for falls in the elderly is an impaired postural control, which is defined as the act of maintaining, achieving or restoring a state of balance during any posture or activity. A growing number of studies show the potential of video games incorporating training (exergames) to improve postural control. However, scarce evidence is available that these interventions actually contribute to a decrease in fall risk. Finding indicators for improved postural control are needed in order to be able to validate fall risk interventions. By studying age related postural adaptations to perturbations that challenge balance in a controlled environment like CAREN (Computer Assisted Rehabilitation Environment) insight into these indicators can be gained. Eventually these findings can be used for validating an exergaming training intervention in terms of reducing fall risk by improving postural control.

Study objective

To gain insight into factors that indicate an improved postural control by evaluating balance recovery (in terms of centre of mass (CoM) and centre of pressure (CoP)) of both young and older adults during a reaching task while exposed to perturbations of physical, visual or cognitive factors, causing a near fall.

Study design

The present study has a cross-sectional study design. Balance recovery of different age groups will be measured during experimental sessions. Both young and older adults will be exposed to three different types of perturbations (divided in three experiments) during the performance of a weight-shifting task.

Intervention

Both young and older participants will perform multiple target-directed weight shifting movements, i.e. reaching tasks, in three simulated fall risk situations which are divided in three experiments. The experiments will be conducted in the CAREN (Computer Assisted Rehabilitation Environment) lab.

• Experiment 1. Mechanical perturbations
Mechanical perturbations will be created by sudden platform translations with different velocity profiles during the performance of multiple reaching tasks.

• Experiment 2. Visual surround manipulation
Visual surround will be manipulated by applying optic flow patterns on a large

screen in front of the subjects during the performance of multiple reaching tasks.

• Experiment 3. Cognitive demanding dual task
Participants will perform a continuous cognitive demanding dual task during the performance of multiple reaching tasks.

Study burden and risks

Balance is challenged during an everyday standing-reaching task. Participants are wearing a harness during all trials which is attached with a girdle to the frame of the CAREN system. During all trials an assistant remains at the side of the subjects. Time between trials will be enough to let the participants recover and prepare for upcoming trials.Therefore the risk associated with participation can be considered negligible and the burden can be considered minimal.

Contacts

Public
Universitair Medisch Centrum Groningen

Antonius Deusinglaan 1
Groningen 9713 AV
NL
Scientific
Universitair Medisch Centrum Groningen

Antonius Deusinglaan 1
Groningen 9713 AV
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

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

Inclusion criteria

Age between 20 and 90 and are able to walk 200 m without aids (to a nearby shop), understand verbal instructions and have the visual ability to perceive the information presented on a large screen .

Exclusion criteria

Not able to walk without aids, with orthopaedic or neurological disorders which prevent them from standing and reaching, have visual or hearing deficiencies that prevent them from perceiving or hearing presented information or/and have cognitive impairments that prevent them from understanding our instructions

Study design

Design

Study type: Interventional

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

Recruitment

NL

Recruitment status:	Will not start
Enrollment:	135
Type:	Anticipated

Ethics review

Approved WMO

Date:	23-10-2013

Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

ID: 23172
Source: NTR
Title:

In other registers

Register	ID
CCMO	NL43581.042.13
Other	nnb
OMON	NL-OMON23172