



NeuRA

Falls, Balance & Injury Research

A multifactorial approach for treating dizziness in older people: a randomised-controlled trial

Jasmine Menant, Jacqueline Close, Americo Migliaccio, Nick Titov,
Kim Delbaere, Daina Sturnieks,
Catherine McVeigh, Stephen Lord

www.NeuRA.edu.au

Dizziness

Dizziness...

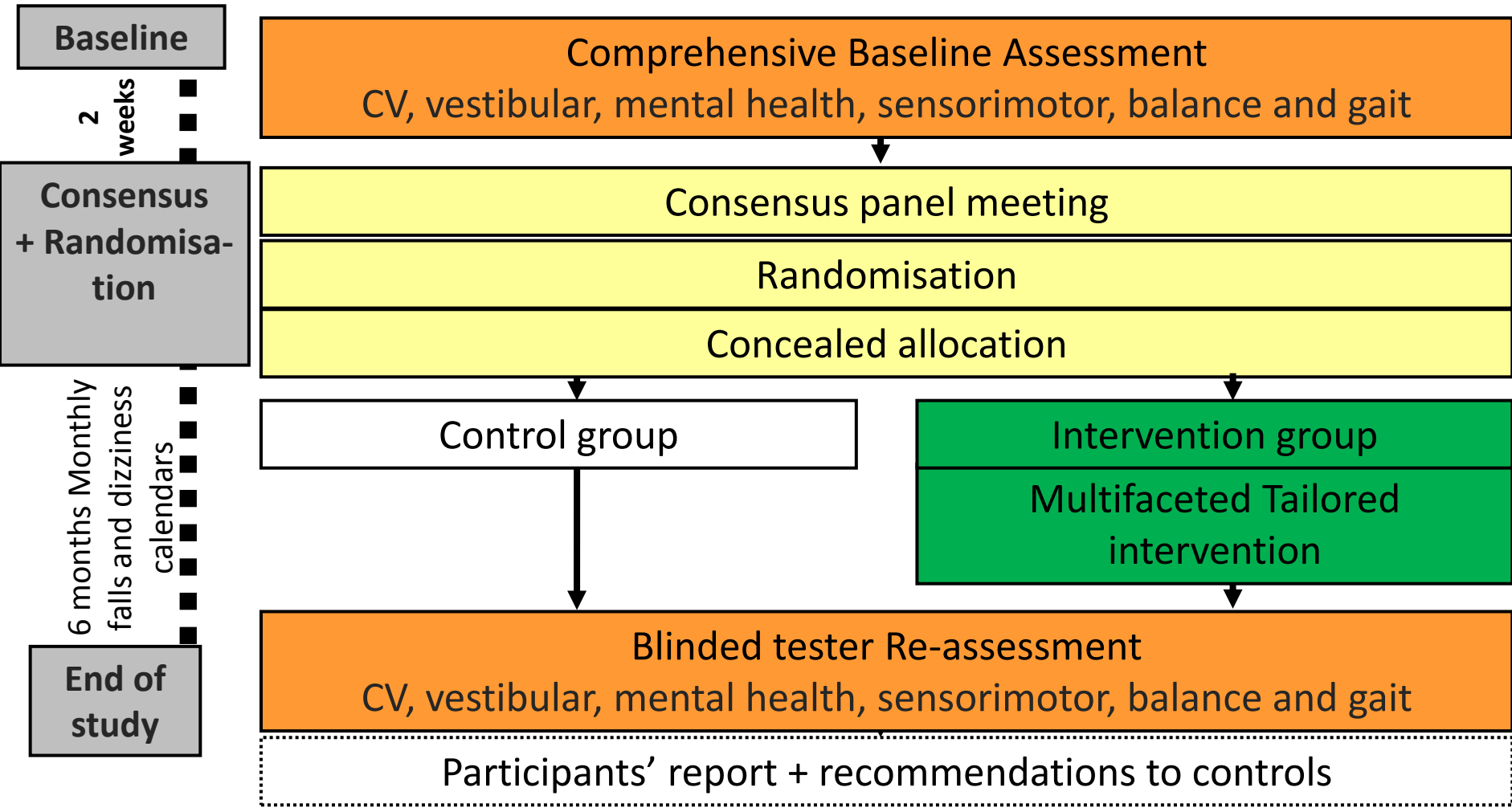
- Reported in 10% -30% of community-dwelling older people & prevalence increases with advancing age
 - Independent risk factor for falls in older people
 - Associated with reduced quality of life
 - Often multifactorial which makes differential diagnosis difficult
-

Aims of the study

- Improve the diagnosis for dizziness in middle-aged & older people with a multidisciplinary assessment
 - Assess the effectiveness of a tailored multifaceted dizziness intervention using a randomised controlled trial design
 - Develop a multiple profile assessment for dizziness based on the best discriminatory tests
-

Participants

- N= 313 adults aged ≥ 50 years and over
 - 1+ significant episode in past year & not currently treated for it
 - Independent living
 - Understanding English
 - No severe cognitive impairment (GP-cog >4)
 - Exclusion criteria
 - Degenerative neurological condition (PD, MS etc.)
 - Severe depressive symptoms, severe anxiety symptoms, other conditions that require urgent treatment (Suspected stroke; TIA; acute cardiovascular condition)
-



Questionnaires

- Demographics
- Medical conditions
- Medications
- Physical activity
- Depression
- Anxiety
- Neuroticism
- Quality of life
- Dizziness –specific questionnaires
 - Dizziness Handicap Inventory *
 - Symptoms frequency *



“...I’ve torn up the questionnaire but am using the lovely pen you sent me...”

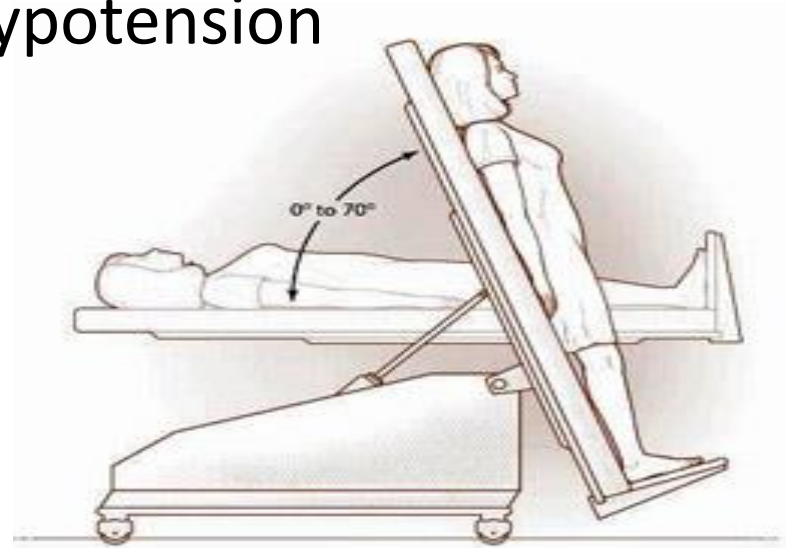
** RCT Primary outcome measures*

DIZZINESS HANDICAP INVENTORY

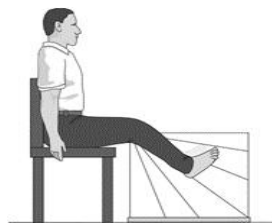
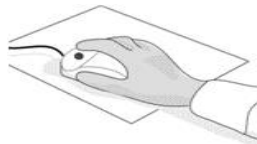
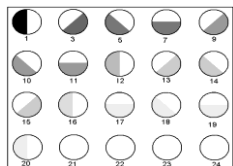
Item	Question		Y	N	S
1.	Does looking up increase your problem?	P			
2.	Because of your problem, do you feel frustrated?	E			
3.	Because of your problem, do you restrict your travel for business or recreation?	F			
4.	Does walking down the aisle of a supermarket increase your problem?	P			
5.	Because of your problem, do you have difficulty getting into or out of bed?	F			
6.	Does your problem significantly restrict your participation in social activities such as going out to dinner, the movies, dancing or to parties?	F			
7.	Because of your problem, do you have difficulty reading?	F			
8.	Does performing more ambitious activities such as sports or dancing or household chores such as sweeping or putting dishes away increase your problem?	P			

Cardiovascular assessment

- Tilt-table test of Orthostatic hypotension (3min) / delayed (3min +)
 - Fall ≥ 20 mmHg in SBP
 - And/or fall ≥ 10 mmHg in DBP
 - Dizziness symptoms
- 12-lead ECG
- Lying and seated blood pressure



Sensorimotor and balance assessment



Physiological Profile Assessment (PPA): composite fall risk score



error score=16



Dynamic stability

Choice-stepping reaction time *

Step time variability *

* RCT Primary outcome measures

Vestibular assessment

- Benign paroxysmal positional vertigo (BPPV)
- Vestibular hypofunction



Spontaneous ,
gaze-directed and
head-shaking
nystagmus in light
and darkness



Head impulse test



Dix-Hallpike test



Preliminary results – what is dizziness?

“An earthquake inside me”

“Electric shock”

*“I feel disconnected –
like I am floating on a
wharf”*

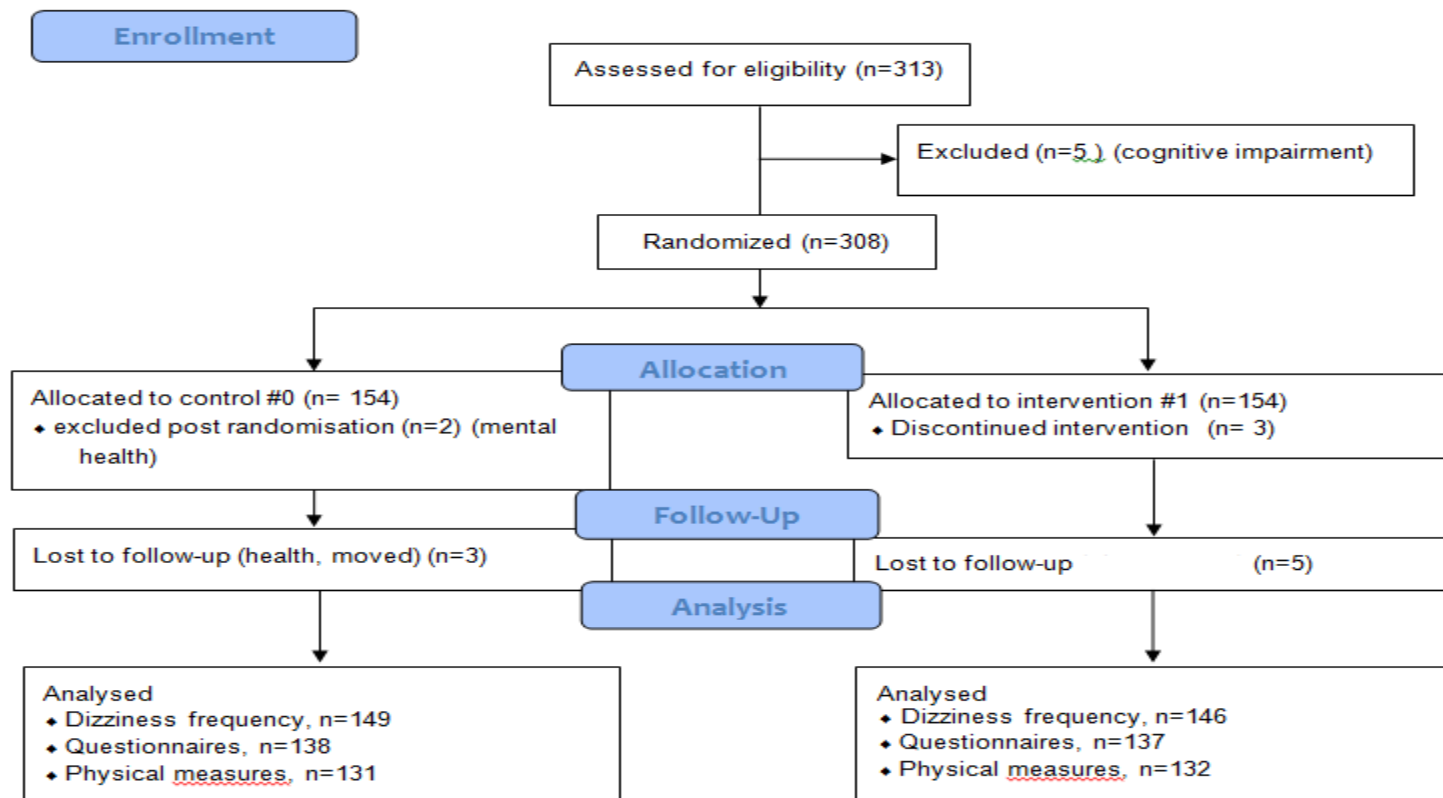
“Like an elephant sitting on my head”

“Feeling of “woo!”

*“Electric blue jagged lines and multi-
coloured rectangles”*

“Frostbite in the brain – only happens in winter “

Study flow chart



Participants' characteristics

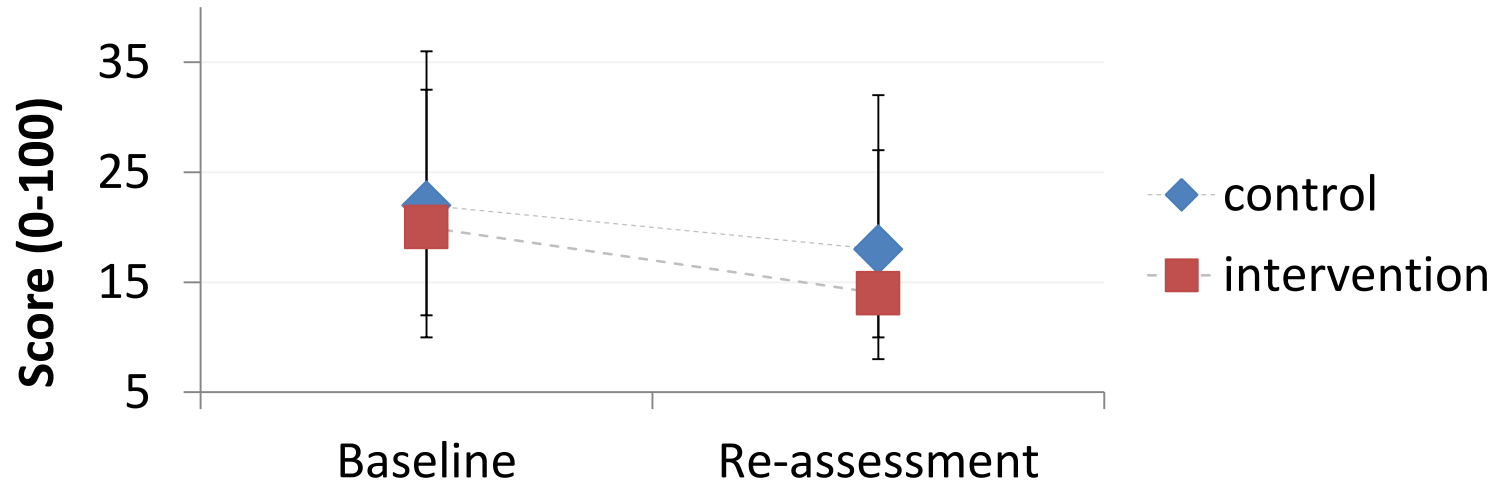
Variables (n (%) or mean (SD))	Whole sample N=295	Control N=149	Intervention N=146
Age (years)	67.7 (8.2)	67.6 (8.1)	67.7 (8.3)
Female gender	185 (63%)	99 (66%)	86 (59%)
History of head injury	41 (14%)	21 (14%)	20 (14%)
Anxiety/depression	44 (15%)	25 (17%)	19 (13%)
Transient Ischemic Attack / stroke	21 (7%)	12 (8%)	9 (6%)
Neck / back pain	200 (68%)	100 (67%)	100 (69%)
Unexplained collapses	32 (11%)	14 (9%)	18 (12%)

Tailored interventions

Problem	Intervention
Poor balance / strength	Otago home exercise program with exercise physiologist, n=38 (25%)
BPPV /vestibular hypofunction	Epley maneuver or vestibular rehabilitation with vestibular physiotherapist , n=62 (40%)
Cardiovascular, Meds, Neuro...	POWH Falls Clinic / Geriatrician (medication review, blood pressure), n=9 (6%); or letter to GP, n=68 (44%)
Severe Anxiety / Depression	8 weeks booklet based Cognitive-Behavioural Therapy with phone-based psychological support, n=29 (19%)

No problem identified No intervention, n=22 (14%)

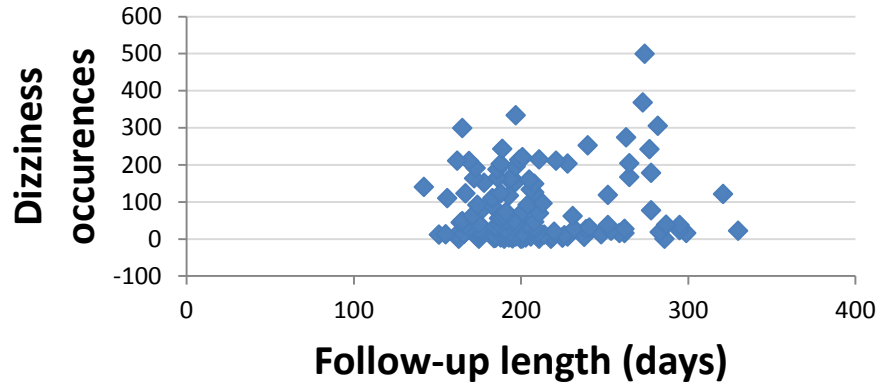
Dizziness handicap inventory (median IQR)



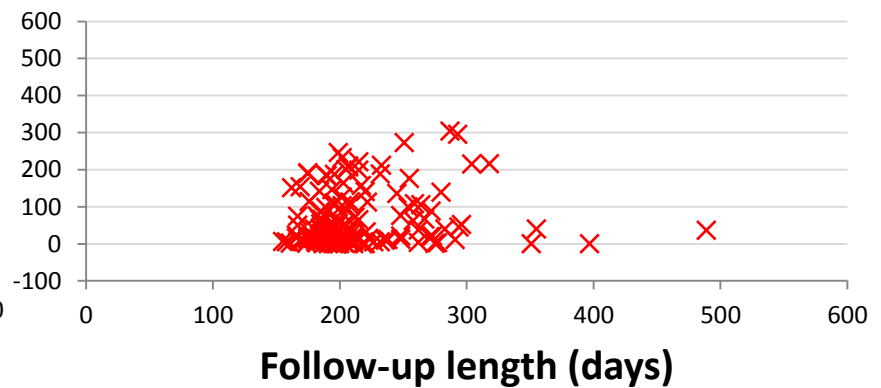
- Generalized linear model
- $\chi^2 = 8.20, p = 0.004$

Dizziness frequency during follow-up period

Control

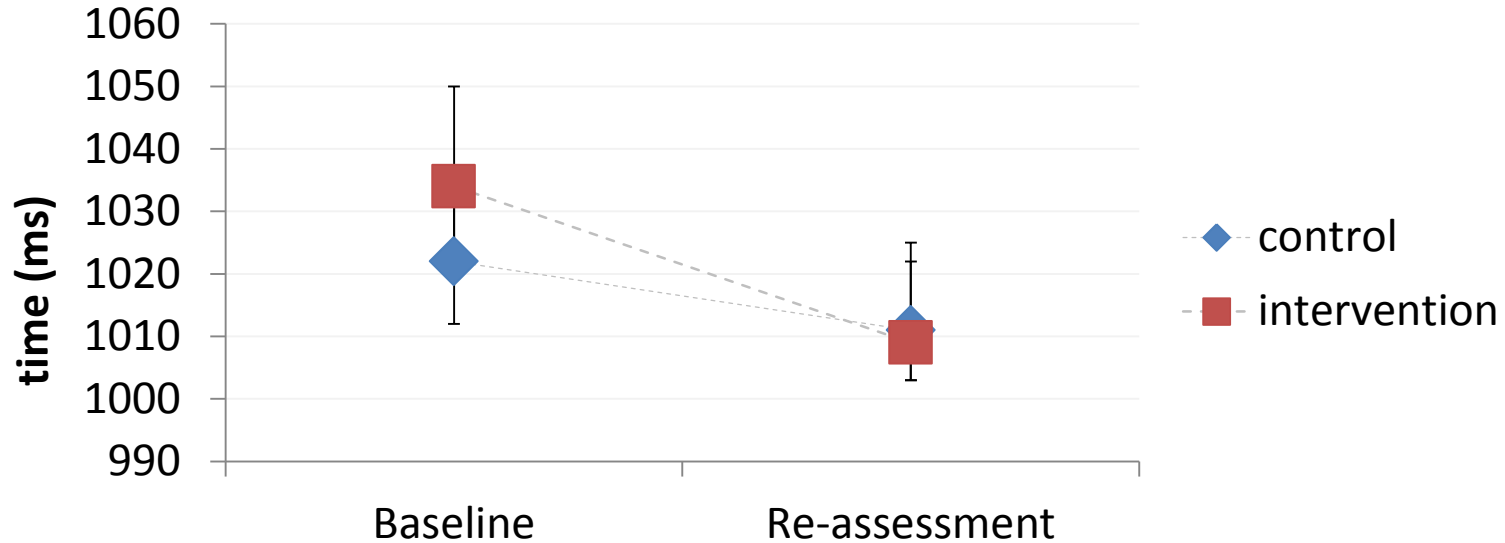


Intervention



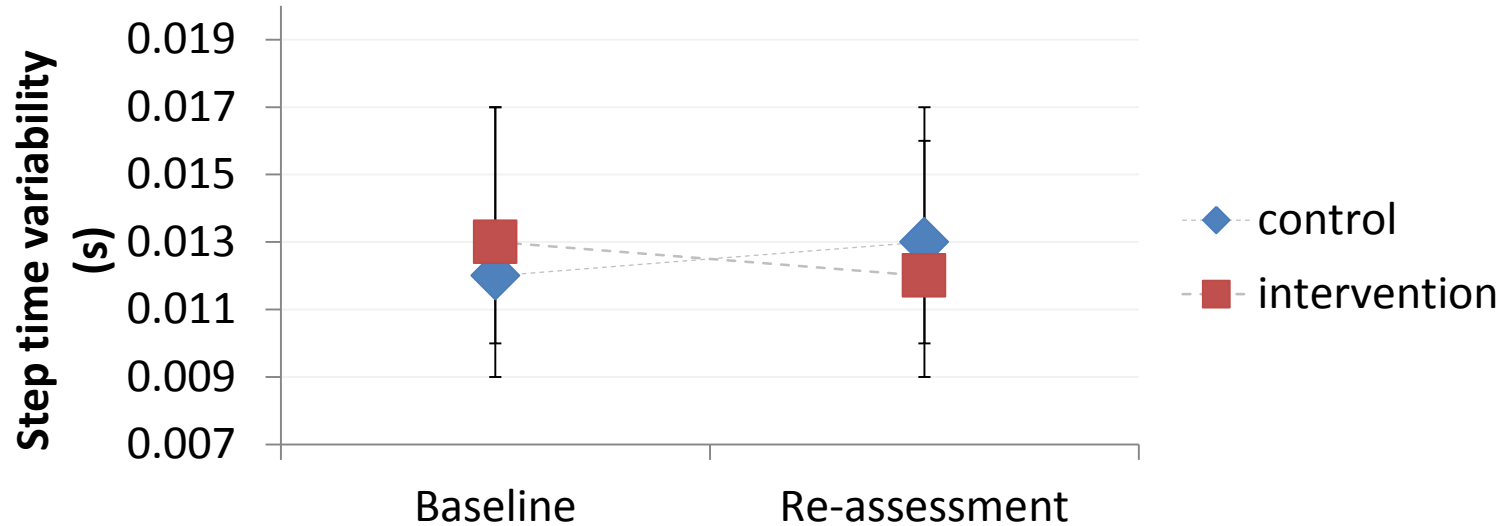
- Median dizziness rate: 34 (10.5 – 122) vs 36.5 (10-105.5)
- Median follow-up (days): 197 (185 -219) vs. 202 (187-228)
- Incidence rate ratio=0.86 , 95%CI 0.64 to 1.14, p=0.297, n=295

Choice-stepping reaction time (median IQR)



- Generalized linear model
- $\chi^2 = 1.35$, $p = 0.246$

Step time variability (median IQR)



- Generalized linear model
- $\chi^2 = 0.67, p = 0.414$

Future analyses

- Secondary outcome variables
 - Subgroup analyses:
 - Type of intervention
 - Age
 - Adherence to interventions
-

Acknowledgements

- Co-Chief Investigators: Stephen Lord, Americo Migliaccio, Nick Titov, Jacqueline Close, Kim Delbaere
 - Collaborators: Daina Sturnieks, Catherine McVeigh
 - Research staff and students: Mayna Ratanapongleka, Joanne Lo, Jessica Turner, Cameron Hicks, Daniela Meinrath , Holly Hawtin, Georg Poller, William Figtree, Adam Chau
 - NHMRC project grant funding: 1026726
 - ANZ Clinical trial registry: 12612000379819
-