



Non-Pharmacological
Intervention Society

Non Pharmacological Interventions Registry

Protocol : Otago Program

Health problem: Risk of fall



Bodily

Sheet Code

NPIS-00000008

Designation

Otago Program

Category

Bodily

Main Health benefit

- Risk of fall <https://icd.who.int/browse10/2019/en#/W00-W19>
- ICD10: W00-W19

Explanation

- 47% reduction in the risk of falls 1 year after the initial program.
- 35% reduction in the number of falls in the year following the program.
- 35% reduction in the number of injuries in the year following the program (Campbell, 1997; Robertson, 2005).

- Development of functional abilities, gross motor skills, locomotion, balance and proprioception.

Routine Test

Monopodal test and Timed Up and Go (TUG).

Threshold

Maintenance of less than 5 seconds in the monopodal test and of more than 15 seconds in the Timed Up and Go (TUG) test.

Minimal Clinically Important Change

Improvement of Test monopodal and/or Timed Up and Go (TUG) tests.

Secondary benefits

- Improvement of postural and balancing abilities (Chiu, 2021).
- Improvement of dynamic balance (Campbell, 1999a).
- Improvement of walking speed (Campbell, 2007).
- Improvement of functional abilities (Jahanpeyma, 2021).
- Cost-effectiveness (Campbell, 2001; Robertson, 2001; Davis, 2020).
- Decrease of sedentary time (Campbell, 2007).
- Encouragement of daily physical activity such as household chores, walking, gardening, social activities involving the body (Campbell, 2007).

Direct Risks

- Falls with minor consequences.
- Fatigue and minor pain.

Risks of interaction

None found to date.

Biological and Psychosocial Mechanisms

- Reconditioning of balance function with improved perceptual and motor sub-functions (Alizadehsaravi, 2022).
- Reconditioning of muscular function with muscle gain, improved proprioception (Joshua, 2014).

Responding population

People over 80 at moderate to high risk of falling.

Nonresponding population

Contraindicated in cases of severe cognitive impairment or behavioural problems incompatible with group practice.

Participants

Individual and group

Minimum : 3

Maximum : 6

Duration

24 weeks

Sessions per week

3 supervised sessions

Procedure

- Test and programming session in the home (60 minutes).
- On-site visit in months 1, 2 and 6 (30 minutes).
- Telephone reminder in months 3, 4 and 5 (5 to 10 minutes).
- Start slowly.

- Set realistic goals.
- Plan 1 booster session at home after a health problem.
- Practice in a well-lit, accessible area with no slippery surfaces.
- Appropriate choice of slopes and stair heights.
- Involve family members.
- Inform the general practitioner.
- Record the number of falls and the number of sessions completed.
- Group practice to boost motivation.
- Each session includes a warm-up at the beginning and a cool-down at the end to avoid injury and encourage practice.
- Wait for at least 2 sets of 10 repetitions before changing levels.

Components

Muscle strengthening exercises:

- Knee extensor muscles (anterior thigh strength),
- Knee flexor muscles (posterior thigh strength),
- Hip abductor muscles (lateral hip strength),
- Ankle plantar flexor muscles,
- Ankle dorsal flexor muscles.

Balancing exercises:

- Maintaining bipodal posture with feet apart, feet together, feet in semi-tandem, feet in tandem (heel-toe),
- Maintaining a unipodal posture with feet moving flat, on tiptoes and heels, forwards, backwards, with lateral projection, in rotation,
- Knee bending (chair raising, stair climbing and descending).

Walking:

- At least 30 minutes, with sequences of at least 10 minutes each,
- At least 2 times a week.

Equipment

- 2 weighted bands for pegs from 0.5 to 1 kg.
- 1 chair.
- 1 table for lateral support.

- 1 illustrated program book https://www.livestronger.org.nz/assets/Uploads/Exercise-at-home/Otago-Exercise-Programme-Manual_English.pdf
- 1 session schedule with incident report.

Location

- Physiotherapist's office, residence or healthcare facility in a well-lit, accessible room with no slippery surfaces.
- 1 hip cushion if required.

Best implementation practices

- Group practice to boost motivation.
- 5-minute warm-up phase at the start of the session, to avoid injury.
- 5-minute recovery phase at end of session to refocus on sensations and encourage practice.
- Wait for at least 2 sets of 10 repetitions before changing levels.
- Practice in a safe place (table, chair, support).
- Recommend drinking water before you feel thirsty (before, during and after).
- Recommend wearing glasses and hearing aids where appropriate.
- Recommend wearing suitable shoes and clothing.
- In addition to sessions, ask patients to walk for 30 minutes, with sessions of at least 10 minutes, twice a week.
- Allow 1 day's recovery between 2 sessions.
- Know how to call for help in the event of a problem.
- A manual has been created by the NPI designers and is available online at https://www.livestronger.org.nz/assets/Uploads/Exercise-at-home/Otago-Exercise-Programme-Manual_English.pdf

Best practices for sustainability

- Contribute to the continuation of sessions and independent walking.
- Prepare group sessions to maintain motivation and learning.
- Encourage other physical activities (gardening, housework, walking, dancing, cultural outings, etc.).
- Ensure good practice through a quarterly telephone reminder (5-10 minutes).
- Organize a home booster visit to check that the exercises are being carried out correctly, and to maintain motivation.

Precautions

- Make sure that practice is pain-free, particularly in the case of osteoarthritis, osteoarticular and musculotendinous conditions, osteoporosis or painful illness.
- Ask patients to contact their doctor if they experience chest pain, difficulty breathing, dizziness, persistent muscle pain or a severe fall.
- Suggest the use of a hip-protecting cushion in the event of repeated falls.
- The Otago program can be used individually with people suffering from dementia (Ries, 2022) or visual impairment (Campbell, 2005).

Regulatory specification

- Medical prescription, including from the general practitioner (Gardner, 2022).
- Free of charge, but the practitioner must systematically quote the program.

Main Initiator

Archibald John Campbell et Clare Robertson, Faculty of Medicine, University of Otago, Dunedin, New-Zeeland.

Qualification required

- Physiotherapist.
- Occupational therapist.
- Nurse for group sessions with people at moderate risk of falling.
- Otago program training.

References

Prototypical study

Campbell AJ et al. Elderly people who fall: identifying and managing the causes. Br J Hosp Med. 1995 Nov 15-Dec 12;54(10):520-3. <https://pubmed.ncbi.nlm.nih.gov/8574496/>

Pivotal mechanistic study

Alizadehsaravi L, et al. The underlying mechanisms of improved balance after one and ten sessions of balance training in older adults. Hum Mov Sci. 2022 Feb;81:102910.

<https://dx.doi.org/10.1016/j.humov.2021.102910>

Pivotal intervention trials

Campbell AJ, et al. Randomised controlled trial of a general practice programme of home based exercise to prevent falls in elderly women. *BMJ*. 1997 Oct 25;315(7115):1065-9.

<https://dx.doi.org/10.1136/bmj.315.7115.1065>

Robertson MC, et al. Effectiveness and economic evaluation of a nurse delivered home exercise programme to prevent falls. 1: Randomised controlled trial. *BMJ*. 2001 Mar 24;322(7288):697-701. <https://dx.doi.org/10.1136/bmj.322.7288.697>

Intervention studies assessing the risks

Campbell AJ, et al. Falls prevention over 2 years: a randomized controlled trial in women 80 years and older. *Age Ageing*. 1999a Oct;28(6):513-8.

<https://dx.doi.org/10.1093/ageing/28.6.513>

Campbell AJ, et al. Psychotropic medication withdrawal and a home-based exercise program to prevent falls: a randomized, controlled trial. *J Am Geriatr Soc*. 1999b Jul;47(7):850-3. <https://dx.doi.org/10.1111/j.1532-5415.1999.tb03843.x>

Implementation study in Europe

Zak M, et al. Physiotherapy programmes aided by VR solutions applied to the seniors affected by functional capacity impairment: Randomised controlled trial. *Int J Environ Res Public Health*. 2022 May 15;19(10):6018. <https://dx.doi.org/10.3390/ijerph19106018>

Others

Campbell AJ et al. Randomised controlled trial of prevention of falls in people aged > or =75 with severe visual impairment: the VIP trial. *BMJ*. 2005 Oct 8;331(7520):817.

<https://dx.doi.org/10.1136/bmj.38601.447731.55>

Campbell AJ et al. Rethinking individual and community fall prevention strategies: a meta-regression comparing single and multifactorial interventions. *Age Ageing*. 2007 Nov;36(6):656-62. <https://dx.doi.org/10.1093/ageing/afm122>

Chiu HL et al. The effects of the Otago exercise programme on actual and perceived balance in older adults: A meta-analysis. *PLoS One*. 2021 Aug 6;16(8):e0255780.

<https://dx.doi.org/10.1371/journal.pone.0255780>

Davis JC et al. Action Seniors! Cost-effectiveness analysis of a secondary falls prevention strategy among community-dwelling older fallers. *J Am Geriatr Soc.* 2020 Sep;68(9):1988-1997. <https://dx.doi.org/10.1111/jgs.16476>

Gardner MM et al. Application of a falls prevention program for older people to primary health care practice. *Prev Med.* 2002 May;34(5):546-53. <https://dx.doi.org/10.1006/pmed.2002.1017>

Howe TE et al. Exercise for improving balance in older people. *Cochrane Database Syst Rev.* 2011 Nov 9;(11):CD004963. <https://dx.doi.org/10.1002/14651858.CD004963.pub3>

Jahanpeyma P et al. Effects of the Otago exercise program on falls, balance, and physical performance in older nursing home residents with high fall risk: a randomized controlled trial. *Eur Geriatr Med.* 2021 Feb;12(1):107-115. <https://dx.doi.org/10.1007/s41999-020-00403-1>

Joshua AM et al. Effectiveness of progressive resistance strength training versus traditional balance exercise in improving balance among the elderly - a randomised controlled trial. *J Clin Diagn Res.* 2014 Mar;8(3):98-102. <https://dx.doi.org/10.7860/JCDR/2014/8217.4119>

Ries JD et al. Feasibility of a small group Otago exercise program for older adults living with dementia. *Geriatrics (Basel).* 2022 Feb 24;7(2):23. <https://dx.doi.org/10.3390/geriatrics7020023>

Robertson MC et al. Statistical analysis of efficacy in falls prevention trials. *J Gerontol A Biol Sci Med Sci.* 2005 Apr;60(4):530-4. <https://dx.doi.org/10.1093/gerona/60.4.530>

Thomas S et al. Does the 'Otago exercise programme' reduce mortality and falls in older adults? A systematic review and meta-analysis. *Age Ageing.* 2010 Nov;39(6):681-7. <https://dx.doi.org/10.1093/ageing/afq102>

Author(s) of the Sheet

Pierre-Louis Bernard 

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Contact the NPIS

5, rue des Reculettes, 75013 Paris - France

Phone: +33 (0)1 56 79 17 91

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