

Poor balance, muscular weakness and sedentariness are risk factors for falls.

Many older people experience **balance deficits** and a **reduction in muscular strength and power**. These are the two most important modifiable risk factors that can be influenced by a regular training programme. Programmes must be tailored to the individual (see summary) in order to be effective and to reduce the risk of falls.

What works?

Exercise is included in nearly all effective multiple interventions. To engage older people the emphasis should be primarily on strength and balance and healthy active ageing, rather than falls prevention.

Programmes with multiple categories of exercise:

Multiple-component group and home-based exercise programmes (*e.g.* evidence based programmes such as *Otago*, *FaME*, *LiFE*) [*see section on evidence based programmes for details*], usually containing at least balance and strength training, have been proven to reduce falls. Other categories of exercise that can be included in multi-component exercise interventions but for which the evidence is less strong include *3D training* (constant repetitive unsupported movement through all three spatial planes) like *square stepping*, *flexibility training* or *endurance training*. The *LiFE-programme* (Clemson, 2010) comprises balance and strength exercises embedded into daily activities of living and has been demonstrated effective in reducing the rate of falls.

Programmes with one category of exercise only:

Tai Chi as a group exercise reduces falls, but it appears to be more effective in participants that are not at high risk of falling. *Balance exercises* as well as *gait and functional training* reduce the rate of falls but not the risk of falls, whereas *strength/resistance training* and *general physical activity* (walking) delivered alone are not effective in reducing falls.

Multiple Interventions:

A study with “*multifaceted*” *podiatry* (customised orthoses, footwear review, falls prevention education), including foot and ankle exercises has been demonstrated to be as effective for preventing falls in older people with disabling foot pain (Spink et al., 2011).

Who can help older people with exercise?

Individuals from many professional backgrounds (including physiotherapists, sport scientists and exercise instructors), who are appropriately trained in delivering falls prevention exercise programmes.



Assessment tools

Participants should be carefully assessed before intervention to ensure the correct type of programme is chosen and that the programme is tailored to the older person's needs.

Appropriate **assessment** tools should be chosen to show progress. Suitable tests include:

- *Berg Balance Scale* to assess balance
- *Short Physical Performance Battery* to assess balance and strength
- *Senior Fitness Test* to assess balance, strength and endurance

What does not work?

There is no evidence for *chair-based exercises* in reducing falls. Brisk walking is not recommended for those at high risk of falls and can increase risk of falls for older people (Sherrington et al., 2011). There is also evidence that the presence of walking programs can detract from efficacy (probably too low in intensity, Voukelatos et al, 2014). *Strength/resistance training* and *general physical activity* (walking) delivered alone are not effective in reducing falls. Programmes that are only delivered for a short period of time may increase confidence without sufficiently improving strength and balance and reducing risk.

Summary

In order to be effective, exercise programmes must be challenging, progressive, at sufficient dosage and continued over time, they should:

- Focus on challenging balance and muscle strength and power
- Challenge balance in a standing position and/or gait
- Exercise should be progressive and tailored to participants needs (help them to meet specific goals they have set, designed to consider health conditions).
- Be carried out 2-3 times a week, aiming for about an hour (this may need to be built up over time).
- At least 50 hours of strength and balance exercise should be carried out over a minimum of 6 months. Ideally exercise should be continued for maintenance of reduced risk.
- Be delivered by instructors specially trained in one of the following programmes (Regular contact and feedback from the instructor is helpful):



Evidence based programmes

- **Otago Exercise Programme**

For the exercise booklet in a variety of languages please go to:

<http://profound.eu.com/otago-exercise-program/>

For further information on the Otago Home Exercise Programme, visit

http://www.cdc.gov/homeandrecreationalafety/pdf/cdc_falls_compendium_lowres.pdf

Or

http://www.acc.co.nz/PRD_EXT_CSMP/groups/external_providers/documents/publications_promotion/prd_ctrb118334.pdf

For training in this programme, visit <http://www.laterlifetraining.co.uk/courses/otago-exercise-programme-leader/>

- **Falls Management Exercise programme (FaME)**

For the exercise booklet in a variety of languages please go to:

<http://profound.eu.com/strength-and-balance-home-exercise-booklet-for-older-people-english/>

For further information on the FaME exercise programme, visit

http://www.cdc.gov/homeandrecreationalafety/pdf/cdc_falls_compendium_lowres.pdf

Or <http://www.laterlifetraining.co.uk/fame-rationale-for-an-exercise-programme-to-prevent-falls/>

For training in this programme, visit <http://www.laterlifetraining.co.uk/courses/postural-stability-instructor/>

- **Lifestyle integrated Functional Exercise (LiFE)**

For the exercise protocol please go to:

<http://profound.eu.com/life-lifestyle-integrated-functional-exercise-reducing-falls-and-improving-function/>

Or you can buy the book at

<http://trove.nla.gov.au/work/190816170?selectedversion=NBD52778501>

- **Tai Chi**

You can find out more about Tai Chi, Taijiquan and Qigong across Europe, visit <http://taiji-europa.eu> and <http://www.tcfе.org>

Links and Resources

Links related to exercise and falls

<http://profound.eu.com/>

<http://www.ageuk.org.uk/>



Other resources related to exercise and falls

Videos:

Gait, balance and functional training:

<http://profound.eu.com/video-clip-of-stronger-seniors-balance-exercise-programme-english/>

Strength/resistance training:

<http://profound.eu.com/exercises-online-strengthening-video-english/>

Square Stepping Exercise:

<http://www.youtube.com/watch?v=IfCD7qB2l1k>

Assessments:

<http://profound.eu.com/three-simple-assessment-tests-to-assess-the-patients-risk-for-falling/>

References

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Sherrington C, Tiedemann A, Fairhall N, Close JC, Lord SR. (2011). Exercise to prevent falls in older adults: an updated meta-analysis and best practice recommendations. *N S W Public Health Bull.* 22(3-4):78-83. doi: 10.1071/NB10056.

Spink MJ, Menz HB, Fotoohabadi MR, Wee E, Landorf KB, Hill KD, Lord SR. (2011)

Effectiveness of a multifaceted podiatry intervention to prevent falls in community dwelling older people with disabling foot pain: randomised controlled trial. *BMJ.* 16;342:d3411. doi: 10.1136/bmj.d3411.

Voukelatos A, Merom D, Sherrington C, Rissel C, Cumming RG, Lord SR. The impact of a home-based walking program on falls in older people: the Easy Steps randomised controlled trial. *Age and Ageing.* In Press 16/9/2014

