Workshop 2E & 3E: Balance progression (& regression!)

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This workshop will give new practical exercises to progress balance training and will discuss progression and regression. Firstly, we will review some of the evidence behind balance training and older people.

Good balance is key to reducing the risk of falls but also to maintain mobility and independence. **But what types of exercise help improve balance?**

A Cochrane review by Howe et al (2007) is about to have an update published (with Dawn Skelton as a co-author). The new review, with 64 studies added to the original 34 studies considers the effects of different types of exercise in community dwelling older people on balance. For the 98 included studies there were 10,202 participants at entry. Exercise programmes involving gait, balance, co-ordination and functional exercises; muscle strengthening; 3D exercise (Tai Chi) and multiple exercise types, appear to have the greatest impact on some indirect quantifiable measures of balance such as the Timed Up and Go test, single leg stance, walking speed and the Berg Balance score. Conversely general physical activity (walking and cycling) and exercise involving computerised balance programmes or vibration plates do not appear to have any impact on functional balance (only balance measured statically on force plates). What does this mean? Really it means we have to inform older people that walking does not help everything and whilst we are not suggesting they do not walk recreationally, if they want to improve their balance then they need to challenge it with programmes such as Otago and FaME.

As the 2011 Review is not yet available, you can read the original 2007 review here - http://www.cochranejournalclub.com/preventing-falls-in-nursing-care-facilities-and-hospitals/pdf/CD004963_standard.pdf

Do all forms of exercise that should help improve balance also reduce falls?
Back in 2008, Cathy Sherrington and colleagues published a meta-analysis of exercise programmes and their effects on falls. This seminal paper told us that there were three important aspects to exercise that actually prevented falls:

1) Highly challenging balance exercise that should progression difficulty over the programme duration
2) The duration of the programme should be at least 50 hours
3) That a walking programme on its own increased risk of falls and walking programmes should only be prescribed to those who had received balance and mobility training first if they already had had falls.

Of course, the FaME and the Otago programmes, run by LLT instructors, do meet these criteria. They additionally noted that low intensity balance challenge exercise and shorter duration (less than 5 hours) exercise did not reduce falls even if they had a positive effect on risk factors for falls.
You can view the 2008 review here - http://www.ncbi.nlm.nih.gov/pubmed/19093923

Cathy has just recently published an update to this review, with an additional 54 trials and confirms that exercise as a single intervention can prevent falls (pooled rate ratio 0.84, 95% CI

0.77-0.91). Meta-regression revealed programs that included balance training, contained a higher dose of exercise and did not include walking training to have the greatest effect on reducing falls. They therefore recommend that exercise for falls prevention should provide a moderate or high challenge to balance and be undertaken for at least 2 hours per week on an ongoing basis. Additionally, they recommend that: falls prevention exercise should target both the general community and those at high risk for falls; exercise may be undertaken in a group or home-based setting; strength and walking training may be included in addition to balance training but high risk individuals should not be prescribed brisk walking programs; and other health-related risk factors should also be addressed.
The 2011 review can be viewed here - http://www.ncbi.nlm.nih.gov/pubmed/21632004

What about frailer older people living in residential settings?
Many people say you cannot retrain balance in nursing home residents as often they cannot stand unaided for very long. A recent study in Sweden, involving 9 nursing facilities and 191 older people aged 65 to 100 years old, showed that 29 sessions of high-intensity functional weight-bearing exercise over a three month period improved their balance (Berg Balance Scale) and was independent of their level of function, balance, age or cognition state at baseline.
You can read more about this programme here -
http://www.ncbi.nlm.nih.gov/pubmed/21718270

Workshop progressions/regressions:

The balance progressions/regressions were all used in either the original FaME study or in the FaME arm of the NIHR funded ProAct65+ Study. For further information see http://www.laterlifetraining.co.uk/later-life-training-collaborating-on-nihr-research-project/

ProAct65+ Study, University College London, authors include LLT Directors Skelton and Dinan-Young. Will be published in 2013/14. Compares FaME and OEP with usual care in over 65s.
ProAct65+ progression: From week 16, instructors were advised to use a balance (& strength) circuit lasting 15-20 minutes. These are all progressions. They used 8 stations from the following selection:

- heel walking
- toe walking
- tandem walk
- walk and turn
- walking on uneven surface (constructed from layers of mats – folded, overlapped etc)
- walking on uneven surface eyes closed (with close supervision)
- heel walking/toe walking/tandem walk on uneven surface
- walking backwards
- walking backwards in tandem
- throwing ball to partner in standing
- obstacle course - transferring between chairs: stepping over poles balanced on chairs, uneven surfaces, combined step over on uneven surface
- step swings
- heel toe into toe balance (scoliosis) exercise
- (strength stations: sit to stand, lunges, seated upper back, bicep curls, backward press, seated outer thigh strengthener)

Key progression strategies:

- Circuit
- Backwards work
- High level OEP exercises
- Ball work
- All dynamic (rather than static)
- Along wall so maximum travel (at least 10 steps)
- Uneven surfaces
- Selective use of eyes closed with close supervision (on uneven surface)
- Combining uneven surface with reduced base of support – toe walks, heel walks, tandem walks on uneven mats
- Negotiating obstacle courses
- Negotiating tight turns in both directions (walk and turn & obstacle course)
- Combining the two FaME approaches to reduced base of support (feet in tandem and reduced foot surface in contact with the floor) – scoliosis exercise

Regressions to balance exercise are only used if a person's physical health or functional capacity necessitates (eg. progressive Parkinson's) and you have to adapt the exercise to suit the individual at that point in time.