

Exercise Prescription for the Elderly Client With Compromised Bone Health



Exercise prescription for the elderly client can be a complex task, taking into account many physical, sociological, medical and motivational factors. Physiotherapists are often called upon to prescribe exercise for individuals with low bone density, with the goals of improving or preventing the further loss of bone integrity, and the prevention of falls and the fractures associated with them.

Fall Prevention

Fall and fracture prevention requires that an individual have adequate strength, flexibility, balance, postural control and reaction time to be able to adapt to the changing environment around them; to recognize and respond to hazards and challenges. Physiotherapists are ideally suited to address these issues, but we must also realize that visual acuity (including depth perception and the ability to differentiate light from shadow), footwear (loose slippers versus secure shoes), home factors (stairs, uneven floor surfaces, area rugs) and medications for co-morbid conditions will all affect an individual's risk of falling.

Exercise Prescription

Osteoporosis and Osteopenia are chronic conditions, and the ongoing necessity of exercise must be addressed. Exercise prescription, therefore, must take into account many motivational factors. As creative professionals, Physiotherapists will prescribe an appropriate program with significant variety to help maintain the client's interest. Logistics and the client's own preferences are also considered. Will the client enjoy going to a fitness facility? Would they prefer a scheduled exercise class or would they prefer to exercise at home? Would a group setting be more enjoyable than exercise alone? How much time will they realistically commit to exercise? Because this population is at increased risk of fracture, would this individual be safe to exercise alone, or is supervision necessary?

The Program

Theresa Liu-Ambrose did a study looking at the effect of either a strengthening (weights) or a balance re-training (games and proprioceptive drills) exercise programs on the risk of falling in elderly women. Her results showed a significant reduction in fall risk in both groups when compared to the control (stretching only) group. Either balance or strength training can be beneficial in reducing the risk of

falling, but we also know that weight-bearing, impact absorption and resistance exercise are important to optimize bone health. Specific types of exercise and certain muscle groups have been found to be particularly important. Quadriceps strength is important for function on stairs, arising from sitting and walking (all activities where falls are common) as well as to provide a strong and safe reaction if one stumbles (i.e. preventing a fall to the ground). Tibialis anterior strength and corresponding gastrocnemius and soleus length are important to allow the forefoot to clear the floor easily and effectively and prevent tripping. Balance retraining can include reaction to perturbation, walking in patterns or exercise on unstable surfaces, as well as control of postural sway in more static situations. Precise transversus abdominis and pelvic floor retraining are important components of core stability training.

The specific exercises chosen will be limited only by the imagination of the therapist. **Variety, challenge and an environment the client enjoys** will help with motivation and ongoing commitment to the exercise programme. The concepts of weight bearing and impact (both upper and lower limb), dynamic control (reaction to changes in direction, surface variations, skillful drills) and core control of postural sway can be integrated with the specific strengthening, stretching or muscle activation required. The challenge to the individual must be adequate to maintain interest and allow for progress, but must also be kept at a level which is safe.



The Otago Programme (A.J. Campbell and M.C. Robertson 2001-2003) is a standardized and effective home based exercise program for fall prevention in older adults and includes many excellent specific exercise suggestions. Sport and other exercise approaches (tai chi, yoga, Pilates) are also appropriate in certain clients, though not all components of a complete “bone health” regime may be included.

Conclusion

The elderly client with compromised bone health can benefit greatly from the knowledge, creativity and skill of a physiotherapist. Bone health can be maintained if not improved, and the risk of falling and fracture can be reduced with regular, specific and enjoyable exercise. Quality of life often improves as well, as activities of daily living become easier and the fear of falling becomes reduced. Don't underestimate the potential for this often neglected population to improve with the right kind of motivation and support.

Written by Kate Kennedy



A few suggested references and authors

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