



Dynamic Chiropractic – January 14, 2003, Vol. 21, Issue 02

Lower Extremity Rehabilitation and the Elderly Patient

By Kim Christensen, DC, DACRB, CCSP, CSCS

Whenever an elderly woman needs to build bone mass to help prevent hip fractures, or whenever a patient over the age of 60 needs to regain strength in an injured lower extremity, certain questions arise: What exercises are safe, appropriate and effective? Will instructing this older patient to exercise make the problem worse? As caring doctors of chiropractic, we never want to increase patients' pain or add to their disabilities.

While there are important specific considerations when planning exercises for a patient over age 60, the benefits far outweigh the risks. In fact, it would be a distinct advantage for every person age 60 and over to be under the care of a chiropractor who can advise and provide guidance regarding the most effective forms of general and specific exercise. The following is a review of some general concerns to address before we start an elderly patient on a lower- extremity rehabilitation program, along with some solutions.

Rehabilitation Concerns for the Elderly

Because the lower extremities bear the weight of the entire body, eventually some imbalance or misstep will result in the need for a rehabilitation program. There are several areas in which older patients differ from the younger population. These special concerns include weaker bones, problems with blood flow, joint degeneration and age-related weakness. Let's take a look at each of these problem areas.

Osteoporosis. With aging comes a loss of bone mass in many people, especially postmenopausal women. We don't want to place an elderly patient in a situation that could cause a hip, leg or vertebral compression fracture. Some reports indicate that recommending a walking program may expose elderly patients to a higher risk of ankle fractures, since what is normally a simple ankle sprain becomes a comminuted fracture when the bones are osteoporotic; other authorities state that simple, short walking periods may prevent such. A well-organized study of elderly women found a much higher incidence of thoracic compression fracture after five years of performing exercises that placed the spine in flexion.¹ This means that many of the standard exercises we use, such as knees to chest, and abdominal crunches may need to be modified or even

eliminated in the elderly population.

Hypertension/atherosclerosis. Hardening and constriction of the arteries cause a decrease in blood flow, especially to the extremities. The heart responds by increasing the blood pressure, trying to force blood through the restricted areas. When resting measurements are consistently above 140 mmHg (systolic) and/or 90 mmHg (diastolic), the person has hypertension. Some patients seek medication to control their high blood pressure, especially in the higher age ranges. With normalized blood pressure there is generally a decrease in the likelihood of strokes and heart attacks; however, many patients are still hesitant to exercise, and they become even more sedentary. There is now good evidence that exercise is not contraindicated, and is actually beneficial for patients taking blood pressure medication.² We need to consider what type of exercise is least likely to further increase blood pressure, since we don't want to cause a heart attack or stroke.

Osteoarthritis. Degenerative arthritis is one of the most common musculoskeletal disorders in older adults, causing significant amounts of physical disability. Osteoarthritis afflicts an estimated 20 million Americans, with the knee being the most commonly affected weightbearing joint.³ In addition to pain with movement, the involved joints lose flexibility and strength. Also found is a loss of proprioception, which may be a contributor to impaired balance.⁴ Exercises for the elderly must avoid increasing painful movements, yet improve flexibility, strength and balance. Contrary to what is commonly believed, moderate exercise does not increase the risk for osteoarthritis or exacerbate it; rather, it has been found to improve function and reduce pain.⁵

Deconditioning/low muscle mass. As we age, we become more sedentary. National surveys reveal that 70 percent or more of older adults do not engage in any regular exercise.⁶ This compounds the previously identified loss of strength and muscle mass, and increase in body fat that is normally seen with aging. In fact, this change in body composition is tied to many factors, including poor nutrition; decreased physical activity; increased disability and disuse; type-II muscle fiber atrophy; and drug side-effects.

Benefits of Exercise for the Elderly

The American Geriatrics Society recently reviewed the literature that demonstrates the wide range of benefits obtained when older patients exercise.⁷ There is now a wealth of data that supports the value of resistance exercise in the geriatric population. Improvements are seen in weight and body composition; decreased falls/improved balance; better psychological health; less frailty; and improved function. With

exercise, the resting blood pressure lowers, and there is a reduction in the risk of all-cause mortality.⁸ Studies have shown that the stronger the back and leg muscles are, the higher the bone density is in the region.⁹ These benefits are so widespread, they overwhelm the few detrimental concerns, and encourage us to recommend resistance exercise to older patients who need lower extremity rehabilitation.

Solutions

First, flexion exercises may need to be minimized, performed with caution or eliminated, if there is a likelihood of compression fractures in the spine. In fact, exercises that strengthen the back extensor muscles can decrease the thoracic kyphosis seen in many older women.¹⁰ Repetitive impact stress needs to be reduced, preferably with the use of shoe inserts or custom orthotics made of viscoelastic materials.¹¹ If a joint or muscle is acutely inflamed (with joint effusion), an initial period of relative rest with cryotherapy may be needed. However, during this time, exercise of the opposite leg should be encouraged. Vigorous exercise of the uninvolved contralateral leg muscles will produce a neurological stimulus in the injured side (called the "crossover effect"), and help to prevent atrophy.¹²

As isometric exercises may increase the systolic blood pressure, moderate isotonic (or "dynamic") exercises are safest.¹³ Elastic resistance tubing is an excellent method to provide strengthening dynamic exercise without the need for machines or heavy weights. Older adults may not be able to handle heavy weights and barbells. Studies have shown that a home-based program using elastic tubing can provide significant gains in lower extremity strength and improvements in gait.¹⁴ These exercises can be performed in the standing or sitting position.

Recommended Guidelines

Two major organizations, the American College of Sports Medicine (ACSM)¹⁵ and the National Strength and Conditioning Association (NSCA),¹⁶ have published recommendations to follow when advising older adults to exercise. Both state that aerobic and resistance exercise for older populations is generally safe and can be quite effective for treating specific problems and helping prevent general disability. These guidelines encourage the use of regular physical activity, along with specific exercises to improve endurance, strength and proprioception. Current research has found that even high-intensity training of frail men and women in their 90s is safe and leads to significant gains in muscle strength and functional mobility.¹⁷

Conclusion

An appropriate and progressive rehabilitation program should be started early in the treatment of all patients with lower extremity injuries and problems.¹⁸ Selecting the best exercise approach for an older patient is not difficult, but does require some special considerations. A review of the patient's health history is necessary, in order to identify any complicating or restricting factors. Using the factors described above, an effective lower extremity rehabilitation program can be easily designed for an elderly patient. A closely monitored home exercise program allows the doctor of chiropractic to provide cost-efficient, effective rehabilitation care for patients of all ages.

References

1. Sinaki M, Mikkelsen BA. Postmenopausal spinal osteoporosis: flexion vs. extension exercises. *Arch Phys Med Rehabil* 1984;65:593-596.
2. LaFontaine T. Resistance training for patients with hypertension. *Strength & Conditioning* 1997;19:5-7.
3. Lawrence RC, et al. Estimates of the prevalence of arthritis and selected musculoskeletal disorders in the United States. *Arthritis Rheum* 1998;41:778-799.
4. Wegener L, Kisner C, Nichols D. Static and dynamic balance responses in persons with bilateral knee osteoarthritis. *J Orthop Sports Phys Ther* 1997; 25:13-18.
5. Casper J, Berg K. Effects of exercise on osteoarthritis: a review. *J Strength Condition Res* 1998;12:120-125.
6. Clark DO. Racial and educational differences in physical activity among older adults. *Gerontologist* 1995;35:472-480.
7. Christmas C, Andersen RA. Exercise and older patients: guidelines for the clinician. *J Am Geriatr Soc* 2000;48:318-324.
8. Blair SN, et al. Influences of cardiorespiratory fitness and other precursors on cardiovascular disease and all-cause mortality in men and women. *JAMA* 1996;276:205-210.
9. Sinaki M, Offord KP. Physical activity in postmenopausal women: effect on back muscle strength and bone mineral density. *Arch Phys Med Rehabil* 1988;69:277-80.
10. Itoi E, Sinaki M. Effect of back-strengthening exercise on posture in healthy women 49 to 65 years of age. *Mayo Clin Proc* 1994;69:1054-1059.

11. Schweltnus MP, et al. Prevention of common overuse injuries by the use of shock absorbing insoles. *Am J Sports Med* 1990;18:636-641.
12. Hertling D, Kessler RM. *Management of Common Musculoskeletal Disorders. 2nd ed.* Philadelphia: JB Lippincott, 1990:334.
13. American College of Sports Medicine. Exercise prescription for special populations. In: *Guidelines for Exercise Testing and Prescription.* 1991:166.
14. Jette AM, et al. Exercise- it's never too late: the strong-for-life program. *Am J Publ Health* 1999;89:66-71.
15. American College of Sports Medicine. Exercise and physical activity for older adults. *Med Sci Sports Exerc* 1998;30:992-1008.
16. Pearson D, et al. The national strength and conditioning association's basic guidelines for the resistance training of athletes. *Strength & Conditioning J* 2000;22(4):14-27.
17. Fiatarone MA, et al. High-intensity strength training in nonagenarians: effects on skeletal muscle. *JAMA* 1990; 263(22):3029-3034.
18. Kibler WB, et al. *Functional Rehabilitation of Sports and Musculoskeletal Injuries.* Gaithersburg, MD: Aspen Publishers, 1998:252.

Kim Christensen, DC, DACRB, CCSP, CSCS
Ridgefield, Washington

Click [here](#) for more information about Kim Christensen, DC, DACRB, CCSP, CSCS.



Page printed from:

http://www.chiroweb.com/mpacms/dc/article.php?id=8972&no_paginate=true&p_friendly=true&no_b=true