

Maintaining Function and Limiting Falls

Understanding the aging process is the first step in helping elderly people stay as active and independent as possible. While it is true that muscle weakness is an inevitable part of the aging process, it is possible to slow down and, in fact, improve muscle strength in individuals as they grow older.

The statistics

Without regular exercise, muscle mass will decline by an estimated 22 per cent in individuals between the ages of 30 and 70. In addition, strength declines by 50 per cent and power by 75 per cent.

Given these statistics, it is easy to understand why functional independence declines and falls increase significantly in people over the age of 75.

This gradual loss of muscle results in a lower activity level for most people, which ultimately results in even greater muscle loss through 'disuse.' In other words, although we lose muscle strength as part of the natural aging process, the fact that we do less physical activity and exercise as we age is a more significant factor in muscle loss and loss of function than the physiological deterioration of muscle.

The good news

The good news is that regular exercise not only slows the rate of muscle loss, it can fully restore muscle strength and power to its fullest age-related potential — regardless of the level of de-conditioning or the age of the person.

In 1990, researchers from Tufts University in Boston studied frail adults with an average age of 90. These individuals participated in an eight-week program of high-resistance weight training. The nine individuals who completed the program averaged muscle strength gain of 174 per cent and mid-thigh muscle size increases of nine per cent. Mean tandem gait (walking speed) also improved by 48 per cent.

Another group of researchers published a landmark study in 1994, which revealed the effects of strength training on frail, older adults. Of the 100 long term care residents aged 72 to 98 years of age

who participated in the study, 94 completed the high-intensity strength training program. In just 10 weeks, these frail individuals saw increases in muscle strength of 113 per cent and cross-sectional thigh muscle of 2.7 per cent. The researchers also noted significant improvements in gait velocity (walking speed) and stair climbing power.

Maintaining functional independence — and reducing falls

Three years ago, in response to the needs of seniors living in long term care and retirement homes in Canada and based on the available research, we developed an approach to keeping seniors functionally independent and safe from falls. The goal of the program was to keep residents physically fit, active, independent and safe from injury.

Assessment

The program begins with a standardized Falls Risk and Mobility Assessment, which is used to create a benchmark measurement for all residents in a long term care or retirement home. This assessment is a compilation of valid and reliable tests that measure known indicators of falls and declined independence, such as the Tinetti Gait and Balance Test, the Time Up and Go and the Functional Reach Test. The purpose of the assessment tool is to measure the following physical impairments:

- Pain
- Flexibility
- Strength
- Mobility
- Transfers
- Balance
- Endurance
- Risk of Falls

The assessment is repeated every six months in order to monitor the resident's risk of fall and determine if functional independence is being maintained or is improving.

Recommendations

Following this assessment, recommendations are made based on the resident's risk factors. These may include recommendations for strength training, balance training, flexibility training or pain management, to mention just a few.

by Brenda Rusnak

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Program effectiveness

Dr. Mark Chignell, a professor of Mechanical and Industrial Engineering at the University of Toronto, was hired to conduct a study on the effectiveness of this proactive physiotherapy-based strength and balance training program.

In the first phase of the study, data were collected from more than 1,300 residents in 15 homes. Participants were found to have improved Tinetti Scores (a standard method for assessing frailty and risk of falls), particularly those who had significantly lower scores to begin with.

Phase II of the study is currently under way and involves the collection of a highly controlled set of falls statistics from a focused set of retirement and long term care homes.

Based on preliminary findings and anecdotal reports, individualized, physiotherapy-based exercise programs support the



A Rehabilitation Success Story

Marg Cole, a lovely lady who just turned 80 in August, is celebrating life.

Marg spent most of the last year in hospital with a serious medical condition. In fact, the physicians were not even certain she would live. Now back in her retirement home, Marg is happy to report that she is not only alive, but she is also living!

When Marg returned from hospital, she was barely able to get around on her own. "I wasn't walking too well," she admits, "and my balance was not good."

The physiotherapist at the retirement home assessed her gait and balance in March 2008, and reported the following objective measures:

- Tinetti Balance and Gait — 13/28 (high risk to fall);
- Timed Up and Go — 100 seconds to complete; and
- Three-Minute Walk Test — able to walk 357 feet with rollator.

With the physiotherapist's guidance and recommendations, Marg participated in a Strength and Balance Program, as well as individual physiotherapy treatment. Since her discharge from the hospital, Marg has been taking part in approximately 15 to 18 classes each month. "I never miss the exercises," said Marg. "They help me get around more easily ... and [the physiotherapist] keeps track for me."

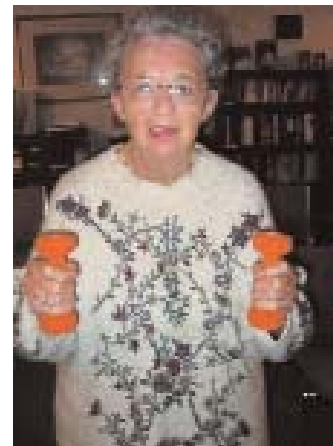
Marg wasn't exaggerating when she said that the programs have helped with her mobility. The physiotherapist re-assessed her in September and found that all Marg's scores had improved.

The gains Marg has made in six months are astonishing. Her Tinetti Balance and Gait score has improved to 17/28. The Timed Up and Go now takes her only 17.75 seconds to complete — down by 82.25 seconds, and Marg is able to walk 526 feet (169 feet further than she could in March) during the Three-Minute Walk — without any gait aids!

Marg will continue to work on her physical strength and balance with the physiotherapist. And although her Tinetti score still shows she is at high risk to fall, there is every indication that she should be able to boost that score to 19/28, which will lower her risk to fall considerably.

"I feel it is certainly valuable to me," said Marg.

And considering how far she has come in just half a year, Marg has reason to celebrate. Not only have her balance and gait changed for the better, but so has her quality of life. **LTC**



research that exercise — in particular, strength and balance training — cannot only improve functional independence but also reduce the risk of falls.

It is unlikely that a general group exercise program, which attempts to address the needs of all residents in the same way, will generate the same results. The keys to the success of this program are assessments and re-assessments, to establish objective benchmarks and individualization.

If strength is to be improved and falls reduced, residents must be properly assessed to determine their physical impairments and then given a specific training program that addresses their individual needs. **LTC**

TESTS YOU CAN USE TO MEASURE FALLS RISK AND FUNCTIONAL INDEPENDENCE

Tinetti Balance & Gait: Divided into two parts, this test looks at balance and gait. The highest possible score for the Balance Test is 16; 12 for the Gait Test. The maximum total score is 28 points. Residents who score less than 19 are at high risk for falls. Residents who score in the range of 19 to 24 are at risk of falls.

Timed Get Up & Go: This test involves rising from a chair, walking three metres, turning and returning to the chair. The person is graded on a scale of 1 to 5, with 1 being normal gait and 5 being severely abnormal gait. A score of 3 or higher indicates an increased risk for falls. In addition, the person is timed and should be able to complete the task in less than 10 seconds. A score of less than 20 seconds indicates independence with transfers (chair/toilet) and gait. Those who take longer than 30 seconds are usually dependent on assistance for gait and basic transfers.

Functional Reach: The subject is asked to reach forward as far as possible without taking a step or touching the wall. The distance between the start and end points is measured using the head of the metacarpal of the third finger as the reference point. Normal values for men are: ages 41 to 69 – 14.98 inches; ages 70 to 87 – 13.16 inches. For women, normal values are: ages 41 to 69 – 13.81 inches; ages 70 to 87 – 10.47 inches.

A Focus on People



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