

Recovering *from* Hip Fracture; Reducing Risk *for* Future Falls

Physical Therapy Research That Benefits You

Your experiences with a physical therapist no doubt revolve around examination and treatment in the clinic, but many physical therapists also participate in research, both in clinical and in laboratory settings. They're scientists whose investigations result in new techniques and provide evidence about what treatments work best with different types of patients.

Two groups of physical therapist researchers who recently published reports of their work in *Physical Therapy*, the scientific journal of the American Physical Therapy Association, have been studying patients with hip fracture.

How big a problem is hip fracture?

By some estimates, more than 300,000 older people a year fracture a hip. If you or a family member has had a hip fracture, you know it can have a devastating effect on quality of life. Less than half of older people with a hip fracture are able to return to their previous level of function, and as many as 38% of hip-fracture patients who lived independently before their injury need long-term care.

Can anything be done to reduce problems following hip fracture?

People who have had a hip fracture may be at risk of future falls that can endanger their health and set back their rehabilitation. A study reported by a group of researchers at the University of Washington in Seattle was designed to identify the risk factors for these falls. They believed that, if these risk factors could be identified, physical therapists could adjust patients' rehabilitation plans and help patients reduce their chances of future falls and hospitalizations.

How did the researchers determine these factors?

They interviewed and examined the medical records of 90 adults between 68

and 98 years of age who had a hip fracture. Initial interviews took place within 2 days of the participants' admission to Northwest Hospital in Seattle. The investigators recorded demographic information, patients' recollection of falls in the 6 months before their fracture, and whether they used a cane or walker before the fracture. Patients' level of independence was measured by asking them to rate their ability to perform 7 different activities of daily living—such as walking, bathing, eating, and dressing—on a scale from 1 to 7 (1="total assistance" and 7="complete independence").

Six months after the patients were released from the hospital, the researchers interviewed them again to obtain information on their health status, the number of times they had fallen since leaving the hospital, and another rating of independence in activities of daily living. The researchers also evaluated their balance and walking speed. Balance was tested in several areas such as sitting, standing, reaching, and stepping. To measure walking speed, the researchers timed the participants as they walked a distance of 12 feet at a comfortable pace.

The subjects in this study reported that they had had a high level of independence in activities of daily living before their fracture. The researchers divided the patients into two groups: those who reported a fall after being released from the hospital and those who did not. More than half of the patients (48 out of 90) reported at least one fall 6 months after their discharge from the hospital. Of the patients who fell, nearly two thirds (30 out of 48) reported two or more falls. Those participants who fell scored lower



on the balance test and had slower gait speeds than those who did not fall. Both groups increased their use of canes and walkers substantially. Overall, 60% of the participants were less able to perform the activities of daily living; 40% returned to their prefracture level. However, 77% of the participants who fell had a lower level of function in activities of daily living, compared with only 40% of the participants who did not fall.

Most studies have limitations of one type or another. In this study, the researchers asked the participants whether they fell in the past and to rate their previous ability to perform daily activities. The participants may have made errors in recalling events. In addition, the study design did not allow the researchers to determine whether the change in the participants' ability to perform activities of daily living was the cause or the effect of the falls reported after the hip fracture.

Based on their analysis of the study data, the researchers concluded that the use of a cane or walker and at least one fall in the 6 months before the hip fracture were risk factors for a fall after release from the hospital.

What does this mean to you?

If you have one of the two risk factors and have fractured your hip, your physical therapist can provide exercises to improve your muscle strength, balance, and mobility and reduce your risk for falls.

What can people with hip fractures do once they return home?

Studies have shown that exercise helps to reduce impairments, limitations, and disabilities in elderly people; however, people in this group may have limited access to exercise facilities. Home-based exercise programs may be a way to alleviate this problem. A study reported by a group of researchers at Arcadia University in Glenside, Pennsylvania, looked at the effects of a 12-week program of high-intensity resistance training or moderate-intensity aerobic training on people who have had a hip fracture. They also wanted to determine whether these activities could be performed at home safely.

There were 33 participants with a mean age of 78.6 years who were randomly assigned to 3 groups: an aerobic training group, a resistance training group, and a control group that received no training. Physical therapists provided resistance training and aerobic training in the participants' homes and collected information that would be used to determine the feasibility of home exercise programs.

What is "high-intensity resistance training"?

The resistance training program focused on muscles in the hip, knee, and foot that have an important role in gait. The program used a portable exercise machine with a series of latex bands with increasing levels of resistance. The resistance was set at the maximum amount that participants could push against for 8 repetitions.

What is "moderate-intensity aerobic training"?

The aerobic training program consisted of walking exercises that elevated the participants' heart rate to 65% to 75% of their maximal heart rate (which was determined by subtracting the person's age from 220) for 20 minutes. The control group did not receive exercise; however, they could receive either training program after the end of the study.

What does the study show?

Both training groups improved isometric strength more than the control group, and adherence to the exercise programs was 98% in both training groups. Ninety-five percent of the exercise sessions were conducted at the target intensity. The researchers concluded that supervised exercise programs in the home were feasible and safe to use with people with hip fractures. Knowing that home-based exercise is both feasible and safe for you, your physical therapist may include a similar exercise program in

your rehabilitation and use this study to justify the program to your health insurance provider.

This study also has some limitations. The researchers used a small group of participants with wide ranges in demographic variables such as age and medication use as well as performance variables such as distance walked in 6 minutes and walking speed. These wide ranges, coupled with the small sample, make it hard for the researchers to detect differences among the groups. All groups, including the control group, increased their walking speed, which indicates that natural recovery may have played a role in the improvement. Natural recovery might make it impossible to determine whether exercise was responsible for the improvement displayed by the training groups.

How can you or your family member with a hip fracture reduce risk and improve daily function?

Recovery from a hip fracture involves more than just repairing the fracture itself. Recovery involves rehabilitation to regain the ability to do tasks of daily living and to prevent further injuries. As part of rehabilitation, physical therapists may develop exercise programs to improve patients' ability to perform activities such as walking, standing, and sitting. With physical therapist supervision, patients can do more than they expect (such as lifting heavy weights). If people know that they can do more, they may be able to achieve better outcomes! **PT**

You can read the full articles about these studies by visiting the Waiting Room at Physical Therapy's Web site, www.ptjournal.org: "Incidence of and Risk Factors for Falls Following Hip Fracture in Community-dwelling Older Adults," by Anne Shumway-Cook, PT, PhD, Marcia A Ciol, PhD, William Gruber, MD, and Cynthia Robinson, PT, MS; and "Can Elderly Patients Who Have Had a Hip Fracture Perform Moderate- to High-Intensity Exercise at Home," by Kathleen K Mangione, PT, PhD, GCS, Rebecca L Craik, PT, PhD, FAPTA, Susan S Tomlinson, PT, DPT, and Kerstin M Palombaro, PT, MS.

