
The Role of Physical and Occupational Therapies in Fall Prevention and Management in the Home Setting

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Mrs. “Smith,” a 90-year-old woman living in New York City alone in a one-bedroom apartment, was referred for physical and occupational therapy by her primary care physician after she fell in her bathtub 10 months prior. The episode made the daily newspapers, as this particular fall resulted in Mrs. Smith being impaled by the bathtub faucet in her torso. The faucet had to be detached from the wall and remained lodged in her until she was delivered to the hospital, where it was surgically removed. The injury nearly killed Mrs. Smith.

After returning to her home following months in the hospital and an inpatient rehabilitation setting and then receiving temporary Medicare-funded home health aides, Mrs. Smith was once again alone. She was receiving only 2 hours of daily private aide care. Physical and occupational therapists visited Mrs. Smith’s home five or six times a week under Medicare Part B. Interventions consisted of strengthening Mrs. Smith’s upper and lower extremities and her trunk muscles and increasing her balance. Mrs. Smith was also trained with adaptive equipment, and a tub transfer bench was added to her bathroom.

Mrs. Smith had sworn that she would never enter her bathtub again, terrified of a repeat fall. Months of practicing and training with the physical and occupational therapist for the purpose of entering and exiting the tub, increasing her strength and balance, and utilizing the tub transfer bench allowed Mrs. Smith to have a shower in her home after nearly a year without one. Tears of joy and satisfaction streamed down her cheeks, as she recognized that she had conquered her fears and now felt confident again to bathe independently; a stronger, safer, and more capable person.

The Centers for Medicare and Medicaid Services, in its July 2007 measure for Medicare Part B fall risk screening, used the definition of Tinetti, Baker, Dutcher, Vincent, and Rozett (1997) to determine the criterion of a fall. The definition reads, “A sudden, unintentional change in position causing an individual to land at a lower level, on an object, the floor, or the ground, other than as a consequence of sudden onset of paralysis, epileptic seizure, or overwhelming external force.” The definition of a fall seems to vary according to institutions; however, a common element seems to be “unintentionally coming to the ground, floor, or other lower level.”

The Centers for Disease Control and Prevention reports that \$19.2 billion annually is spent on treating the elderly for the adverse effects of falls: \$12 billion for hospitalization, \$4 billion for emergency department visits, and \$3 billion for outpatient care. Effective interventions assume that falls are not the result of random accidents but are the result of the presence of numerous risk factors and a compromised medical condition.

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Two-thirds of those who experience a fall will fall again within 6 months. Two-thirds of falls are preventable. At least one-third of all falls in the elderly involve environmental hazards in the home. Most falls do not result in serious injury. However, there is often a psychological impact. Twenty-five percent of community-dwelling people 75 years old or more unnecessarily restrict their activities because of fear of falling.

All health care professionals working with the older population know and understand the implications of falls, and all have a common goal: to improve the quality of life of the older adult. The status of geriatric patients is so complicated for any one medical professional that improved results can be obtained only if the entire interdisciplinary team works together. It is too daunting a task for any one to accomplish alone. The interdisciplinary team must work to maximize the quality of care and the quality of life for patients and their family caregivers. The interdisciplinary team may include but is not limited to the primary care physician, specialist physicians, physician assistants, nurse-practitioners, nurses,

social workers, physical therapists, occupational therapists, administrators, nutritionists, and direct care staff such as certified home health aides. The common goal is to provide the best quality of care and quality of life to our patients.

The objective of this article is to educate readers about the role of rehabilitative services—physical therapy and occupational therapy—in the management of older persons, particularly regarding the challenging syndrome of falls. By understanding the roles of members of the interdisciplinary team, the team members can more effectively and efficiently work together to reach a common goal.

WHO ARE PHYSICAL AND OCCUPATIONAL THERAPISTS?

Current educational levels for both physical and occupational therapists are now moving toward an entry-level doctoral degree for all clinicians. The master's degree is being phased out. The educational process includes not only didactic learning but also numerous internships ranging in number and length depending on the academic institution. After a person graduates with a degree in physical or occupational therapy, all states require a licensing exam to be passed in order to allow practice. Postgraduate residency programs are limited but available to individuals to specialize in a particular area of interest, such as geriatrics. Advanced-level fellowships are also limited in number but are becoming a more common part of advanced learning in the rehabilitation fields. Other levels of advanced clinical practice are board certifications in a clinical area of experience and expertise, such as geriatrics: a geriatric board-certified specialist recognizes advanced clinical knowledge.

Although most entry-level physical and occupational therapy programs include geriatrics as part of the general curriculum, geriatrics itself remains an area of specialization. Not all physical and occupational therapists have the knowledge, experience, or expertise to manage geriatric patients most effectively and efficiently. A further subarea of specialization that requires additional experience and advanced knowledge within geriatrics is management of the patient with Alzheimer's disease or a related dementia.

Physical and occupational therapy for older adults can be utilized in multiple settings across the continuum of care, including acute care, subacute care, long-term care, and outpatient clinics and in the home. The role and goals of rehabilitation services may vary and reflect the treatment setting. For example, the goal of rehabilitation services in the acute care setting may be for the patient to be medically and functionally stable enough to return home with assistance or to transfer to a skilled nursing facility. The goal of rehabilitation services in an outpatient facility may be to reduce pain and improve strength in order to maximize community-level function. Frequency and duration of physical and occupational therapy treatment sessions vary with the setting and with reimbursement restrictions. Generally sessions are 30 to 60 minutes in length, one to five times per week, for a total of 4 to 12 weeks. This article focuses on residential clients at home in the community.

Physical and occupational therapists make substantial use of objective tests and measures for examination. Members of the rehabilitation team are critical thinkers and base their evaluation and determination of individualized treatment plan on objective data. The implementation of evidence-based interventions, continuous reassessment of the patient's status, and modification of the treatment plan ensure progress toward and achievement of goals. The extensive frequency and duration of the treatment plan allow physical and occupational therapists to provide key information to other members of the medical interdisciplinary team. For example, it is standard practice for therapists to measure vital signs at every visit. This basic information can be valuable to the physician in monitoring the effects of and changes in medications in a quick and efficient manner rather than requiring the physician to wait many weeks before the patient returns for the next scheduled office appointment.

Unfortunately, the current medical insurance and reimbursement system for older adults, including Medicare Part A and Part B as well as Medicaid, often dictates the nature of medical care that a patient receives. It is important to understand that not all rehabilitation services are covered the same way in all settings under Medicare Part A and Part B. In terms of the home setting, Medicare Part A covers physical and occupational therapy services as part of a traditional visiting nurse association service. Patients must be homebound to receive therapy services under Medicare Part A. Reimbursement occurs as a lump sum for each episode of care. Assuming that each therapy visit is 30 minutes long, this allows for approximately six to eight visits.

In the home setting, patients can also receive physical and occupational therapy under Medicare Part B. Under Medicare Part B, patients do not need to be homebound. Therapy services are billed and reimbursed the same way they are in the outpatient setting. Currently, Medicare Part B places an arbitrary cap on the maximum dollar amount of therapy services a patient can receive. With the same assumptions as mentioned previously, if each therapy visit is 55 minutes long, this allows for 12 visits. However, Medicare Part B does have an exception process in place for this cap. If patients meet the exception process requirements, they are not limited in the amount of rehabilitation services they may receive under Medicare Part B as long as the therapy remains focused on a functional goal and continued improvement demonstrated. This exception process is very geriatric friendly and includes such diagnoses as osteoarthritis, degenerative joint disease, Parkinson's disease, and hemiplegia/paresis.

Medicare Part B allows skilled physical and occupational therapists to perform prescribed therapies one-on-one with a homebound or nonhomebound patient in the home environment to maximize a patient's functional status.

PROACTIVE FALL PREVENTION

We now discuss how physical and occupational therapy can assist the interdisciplinary team and benefit older adults in the prevention and management of falls.

The 2010 consensus statement of the American Geriatric Society, the British Geriatrics Society, and the American Academy of Orthopaedic Surgeons Panel on Fall Prevention identifies an algorithm for the identification of geriatric patients at risk for falls, the prevention of falls, and management of those patients who have already fallen. They recommend that every older person should be asked the question “Have you fallen in the past year?” as part of a regular examination. This should be as routine as taking vital signs. The person asking the question must be clear in the definition of a fall.

If the answer to the question “Have you fallen in the last year?” is “yes,” action must be taken. This is discussed in the section “Postfall Management.” If the answer is “no,” then additional assessment is still required. It is recommended that a Timed Up and Go (TUG) test be performed. TUG is a standardized test. The subject begins seated in a chair, stands up and walks 3 meters, turns around, and sits down. The therapist times this completed action. Standard scores for an individual who does not ambulate with an assistive device (cane or walker) is less than 10 seconds and less than 13 seconds if the subject does use an assistive device. If the patient is found to be at a fall risk, additional action must be taken, even though the patient has not yet fallen.

Not only should physicians ask the question of all their patients, but so should physical and occupational therapists, regardless of the referring diagnosis. This is another way in which physical and occupational therapists can assist the other members of the medical interdisciplinary team in identifying those patients at risk. It is common for a physical and/or occupational therapist to receive a patient referral with a diagnosis of rotator cuff tear, shoulder pain, and activities-of-daily-living dysfunction. Obviously, therapy will be focused on the shoulder. However, when the question “Have you fallen in the past year?” is asked, the response is often “Yes, I fall all the time, at least one or two times each month. The only difference is that this time I got hurt.” Clearly, an underlying issue is not being addressed, one that has resulted in numerous falls. The medical interdisciplinary team, including physical and occupational therapy staff, must also address the issue of falls with the patient as well as dealing with the patient’s shoulder.

In addition to TUG, there are numerous other objective tests and measures that have been proven valid and reliable. For example, the physical and occupational therapist working with older adults may utilize the Berg Balance Test, the Tinetti Balance Assessment Tool, the Functional Reach Test, and Barthel ADL Index. Normative data are available for the client’s age range as well as identified levels for increased risk of falls.

There are two main categories of risk factors that relate to a person who falls or is at risk for falling: “intrinsic” risk factors (those factors that are inherent to the individual) and “extrinsic” risk factors (those factors in the person’s environment).

EXTRINSIC RISK FACTORS

It is one thing to tell someone to remove the throw rugs. It is another to see the home, assist in removing the throw rugs, reorganize the

home if necessary to remove clutter, rearrange/reorganize the kitchen or bathroom to make it safe to reach commonly used objects, put a night-light in the hallway, and actually clear the path to the bathroom for nighttime visits. This is done in collaboration with the patient, the family, and direct care staff to educate all of them on the importance of the environment in reducing the risk of falls. A home safety evaluation to reduce the risk of falls is a legitimate reason for referral to a physical and occupational therapist.

INTRINSIC RISK FACTORS

As the human body ages, natural physiological changes occur in varying degree. Posture and postural angle changes occur, especially with advancing osteoporosis, causing the spinal column and trunk to flex anteriorly. This causes an anterior weight shift from the person’s normal base of support. This also produces a strain on the posterior musculature of the back and legs and, conversely, shortens the anterior trunk musculature. With increased trunk and hip flexion, an individual’s head position also flexes and decreases the visual navigational field as well as the ability to make visual contact with a potential trip hazard. Following a fall, an individual further exhibits these postural changes due to fear of another fall.

Postural orthostatic hypotension is also a risk factor. A sudden change of position, as in moving from supine to sit, sit to stand, and stand to advancing gait, can temporarily cause a severe drop in blood pressure. This drop can cause a temporary loss of consciousness and lead to a fall. Similarly, positional vertigo, a condition in which the cilia of the inner ear (the cochlea) are misaligned, can cause mild to severe vertigo, with a loss of balance leading to a fall.

ACTIVITIES OF DAILY LIVING

Occupational therapists are trained to educate patients and their caregivers in proper safety awareness during activities of daily living, including such basic activities as feeding, grooming, dressing, bathing, toileting, transferring from surface to surface, and functional mobility around the environment. Instrumental activities of daily living include higher-level activities, such as meal preparation, laundry, and housecleaning. Structuring a patient’s environment and educating a patient and/or the patient’s caregivers to prevent injury and optimize performance are key components of the rehabilitation team’s intervention for reducing the risk of falls and maximizing a patient’s quality of life.

This type of intervention involves education for both the patient and the patient’s caregiver. The following are examples of patient education and training:

- Removing environmental hazards (shoes in the pathway between a patient’s bed and bathroom present as a trip hazard).
- Proper body mechanics when performing lower body dressing or bathing. Seated with back support, raising the

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lower extremities up while maintaining an erect position, reduces strain on the lumbar spine and prevents falling forward.

- Wearing proper footwear that encompasses the entire foot and has a rubber sole (no open-heeled shoes or slippers) ensures proper footing, protects the foot, and reduces fall risk.
- Utilizing grab bars and tub/shower seats reduces the risk of falling when entering and exiting the tub or shower and while bathing sitting on the seat.
- Increasing patients proximity to items they are reaching for to reduce lumbar strain and falling if reaching out of their base of support.

The following are examples of patient caregiver education and training:

- Utilizing proper patient transferring techniques. Bending at the knees and wrapping arms around patient's waist, buttocks, or belt to assist the person to stand. (Never lift a patient under the axillae, as this can cause both nerve/rotator cuff damage to the patient and back injury to the caregiver).
- Keeping the patient proximal to the caregiver to lessen the strain on the caregiver's lumbar musculature.
- Proper guarding techniques while a patient is ambulating or managing stairs to reduce the risk of patient falls without injury to the caregiver.
- Utilizing environmental equipment (such as hospital beds, bedside commodes, walkers, wheelchairs, and bathroom equipment) better to safeguard patients and reduce strain on themselves when assisting the patient.

THERAPEUTIC EXERCISE

Therapeutic exercise is an often underutilized, nonpharmacological treatment option for many geriatric syndromes. Medical long-term care institutional directors knowledgeable about proper prescribing of therapeutic exercise and its positive effects will help residents maintain their optimal functional level. Here we review the efficacy of therapeutic exercise in the management of three common geriatric syndromes: functional disability, falls and cognitive impairment.

Geriatric syndromes are multifactorial in both their cause and their management. Functional disability is often the result of multiple underlying clinical processes such as cardiovascular disease, osteoporosis, and diabetes. Therapeutic exercise in appropriate type, intensity, frequency, and duration elicits a positive physiological response in the cardiovascular and musculoskeletal systems and in glycemic control. With improved physiological responses, therapeutic exercise can contribute to the effective management of functional disability. Evidence suggests that therapeutic exercise is also beneficial for two common contributing factors of falls: gait and balance dysfunctions. In appropriate type, intensity, frequency, and duration, therapeutic exercise can help reduce the risk of falls. Finally, studies also show that people with cognitive impairment who demonstrate challenging behaviors and functional decline can benefit from therapeutic exercise.

Strategies for interdisciplinary teams to design, implement, and track the patient's responses to physiologically effective and safe exercise programs are also discussed. To improve the success of evidence-based exercise programs for both individual patients and residents as a group, we encourage physicians to utilize the interdisciplinary team appropriately. Activity directors, recreation therapists, certified nursing assistants, and personal trainers are not qualified either by their educational level or by licensure to design, implement, and oversee a therapeutic exercise program for medically and cognitively complex geriatric patients. In this case, physical therapists who specialize in geriatrics are the interdisciplinary team member of choice.

Physical therapists receive master's- and doctoral-level education for clinical practice. As with physicians, geriatrics is an area of specialty practice for physical therapists. Experience, expertise, and training are required to work with this special population. Board certification in specialty areas, including geriatrics, is one measure of clinical excellence in physical therapy. Physical therapists are trained in anatomy, neuroanatomy, physiology, kinesiology, basic pharmacology, orthopedics, neurology, cardiology, pulmonology, and endocrinology. However, the primary area of expertise for the geriatric physical therapist is exercise and function. A geriatric physical therapist recognizes the complexities of the patient and the importance of the clinical decision-making process. Careful consideration must be given to the patient's history (including systems review, cognition, function, pharmacy, and social conditions) and assessment so that a safe and effective plan of care can be established. The treatment plan and exercise program must be

comprehensive, take into account all the variables and challenges of managing multiple chronic conditions, and be monitored and adjusted according to the patient's response. A physical therapist can design an exercise program that is safe medically and functionally for a compromised older adult. A physical therapist can train other members of the team to contribute within their scope of practice to the facility-wide exercise program.

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Physicians are encouraged to have a conversation with physical therapists and rehabilitation directors. Discuss the evidence. Discuss the level of education, experience, and expertise that the physical therapist offers in geriatrics with a demented patient population and with the frail elderly. The interdisciplinary team members must work together to provide the best possible care and enhance the function and quality of life of patients. The interdisciplinary team should have shared vision and goals of a facility-wide exercise program that can be tailored to the individual patient's needs as well as encourage all residents to be more active safely.

Physical therapists can be very effective in developing, implementing, and overseeing an exercise program and can assist in solidifying a culture of exercise in the long-term care facility.

Exercise is important in fall prevention, improving strength, flexibility, balance, and gait. A customized, individualized exercise program that incorporates all aspects of therapeutic exercise that is safe and appropriate based on the patient's medical status, cognitive status, and goals is required. Patient, family, and caregivers require exercise techniques, with considered frequency, duration, type, and intensity, to reduce the risk of falls.

Referral is appropriate to physical and occupational therapy for fall prevention in the following circumstances: when a patient reports and/or demonstrates difficulty ambulating, unsteady gait, inappropriate use of walker or cane, fatigue or shortness of breath

while walking short distances, poor safety awareness, or decline in vision. Additionally, referrals may stem from a report or demonstration of loss of balance, fear of falling, frequent falls, or poor safety awareness. Poor safety awareness includes frequent falls and indicates the need for a home safety evaluation. Weakness may be due to a recent illness/exacerbation of chronic illness; recent hospitalization or surgery of any kind; progression of disease affecting function, mobility, or cognition; excessive fatigue/difficulty completing previously simple tasks; and difficulty with activities of daily living.

A referral for skilled physical and/or occupational therapy should be made for an individual if there has been reported or observed a functional decline.

POSTFALL MANAGEMENT

To review the definition of a fall: the Centers for Medicare and Medicaid Services, in its July 2007 measure for Medicare Part B fall risk screening, used the Tinetti definition to determine the criterion for a fall. The definition reads, "A sudden, unintentional change in position causing an individual to land at a lower level, on an object, the floor, or the ground, other than as a consequence of sudden onset of paralysis, epileptic seizure, or overwhelming external force." The definition of a fall may vary according to institutions; however, a common element seems to be "unintentionally coming to the ground, floor, or other lower level."

When a "small" fall has been reported, refer to rehabilitation services immediately—do not wait until the individual has three or four falls per week or per month. Review the statistics stated earlier on the number of falls and the risk for future falls.

Mr. "Jones," an 85-year-old man living in an assistive living facility, found himself on the floor after sliding off his bed attempting to don his shoes. He was not injured, thought nothing of it, and attempted to get back onto his feet. While doing so, he fell again, coming down onto his bedside nightstand, where he suffered multiple fractures to his facial bones and lost consciousness. A facility staff member found him an hour later, and he was admitted to the hospital.

Goals of physical and occupational therapy are to train and educate patients to recover from the fall as well as prevent another fall from occurring. If Mr. Jones had been educated to attempt to climb back onto his bed instead of attempting to stand up from his seated position on the floor, the second fall resulting in hospitalization might not have occurred.

FINAL THOUGHTS

Proactively reducing falls in the geriatric population will significantly reduce the cost of fall-related injuries and add years of healthier living for our elderly patients.

REFERENCE

Tinetti, M., Baker, D., Dutcher, J., Vincent, J., & Rozett, R. (1997). *Reducing the risk of falls among older adults in the community*. Berkeley, CA: Peaceable Kingdom Press.

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