

Building the Crossroad Between Inpatient/Outpatient Rehabilitation and Lifelong Community-Based Fitness for People With Neurologic Disability

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The length of stay in inpatient and outpatient rehabilitation after an injury or illness has declined in recent years, exposing those with newly acquired neurologic disability to a risk of significant postrehabilitation health decline. Following a short stay in outpatient rehabilitation, individuals with neurologic disability have few, if any, options to continue their physical recovery after discharge, thus further increasing their risk for functional decline and secondary conditions. Professionals who work in community-based fitness facilities have the potential to assist therapists in extending the recovery process and preventing this decline. The focus of this article was to address a conceptual framework for better understanding how rehabilitation and health/fitness professionals can work together to help with this growing need. To that end, the antecedents to and effects of postrehabilitation health decline are discussed, followed by the introduction of a theoretical model illustrating a *therapist-to-trainer* system that facilitates the use of community-based fitness facilities by individuals with neurologic disabilities to continue their recovery postrehabilitation. Finally, a thorough description of an exemplary existing community-based inclusive fitness program is presented, followed by examples of select disability groups using these programs for continued recovery. **Video Abstract available** (see Video, Supplemental Digital Content 1, <http://links.lww.com/JNPT/A45>) for more insights from the authors.

Key words: *community, disability, exercise, physical activity, postacute recovery, rehabilitation*

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INTRODUCTION

The majority of people who are hospitalized after an injury resulting in neurologic disability, such as a cerebrovascular accident, traumatic brain injury (TBI), or spinal cord injury (SCI), are transferred as early as possible to a rehabilitation center or skilled nursing facility to receive therapy.¹ Many of these people will return home with few, if any, options to continue their structured recovery after outpatient or home-health therapy.² The requirements for adjusting to life after disability are not typically matched by a community's receptivity in facilitating reintegration,³ and physical activity and wellness are particularly difficult areas of reengagement.^{4–8} While 49.4% of adults without disabilities in the United States meet national physical activity guidelines, a significantly smaller percentage of adults with disabilities (37.7%) meet these same recommendations.⁹ In addition, 25.6% of adults with disabilities are reported to be physically inactive, compared with 12.8% of adults without a disability.⁹ People with disabilities have lower rates of cardiovascular and musculoskeletal health than the general population, which may be associated with lower rates of participation in regular physical activity.^{10,11}

Research involving people with disabilities has identified limited access to fitness and recreation facilities as one of the major barriers to participation in physical activity.¹² Not only are connections between rehabilitation and community-based health/wellness programs often unavailable but also many community-based fitness facilities do not have the support system in place (eg, knowledgeable staff, accessible equipment, adaptive programs) to accommodate people with disabilities,^{4,13–16} even though small improvements in accessibility could substantially reduce key access barriers.

One strategy for promoting reintegration of people with neurologic disability into community wellness is to provide a continuity of recovery, linking rehabilitation and the return home. This link includes providing opportunities to continue therapy and promote general health and physical activity in a community-based fitness facility. These settings contain various equipment, programs, and services that have the potential to directly benefit an individual exiting rehabilitation. Although there are no data available on the number of people with neurologic disability who join a fitness facility, the percentage is likely to be low, given the multiple personal and environmental barriers that must be overcome to join a

community-based exercise facility (eg, cost and transportation being two of the highest ranked barriers).¹⁷⁻²⁰

A new approach that will provide people with stroke, TBI, or SCI with the opportunity to continue their recovery in community-based health and fitness facilities after rehabilitation ends is needed. Opportunities to continue recovery in these facilities have the potential to increase health, social integration, and community participation. This Special Interest article provides a conceptual framework for building a crossroad between inpatient and outpatient rehabilitation and access to community-based fitness facilities to reach a largely underserved population of people with newly acquired neurologic disability.

UNDERSTANDING POSTREHABILITATION HEALTH DECLINE

The number of days individuals have been allotted for rehabilitation after an acute injury has declined markedly in recent years.^{3,21} Changes in payment systems have resulted in shorter lengths of stay in inpatient medical rehabilitation settings over the past two decades,²¹ increasing the risk of postrehabilitation health decline and compromising the health of individuals with neurologic disability. Recent discharge data on patients with traumatic SCI reported that from 2005 to 2008, the average number of days spent in a rehabilitation facility decreased by more than 50%.²² Results from this decrease in the length of stay include higher rates of rehospitalization because of secondary medical conditions and increased rates of discharge to institutional settings.²³ These trends suggest that under the current procedures, patients may be discharged from rehabilitation before reaching the functional capacity necessary for a successful return home and frequently acquire new health conditions or recurring disability (eg, stroke) several months after rehabilitation.^{1,24}

Many people with neurologic disability and truncated rehabilitation may be exposed to a greater risk of secondary health conditions (eg, obesity, pain, deconditioning, fatigue).^{1,25-27} The conceptual model from Rimmer,²⁸ illustrated in Figure 1, depicts 3 possible health trajectories following rehabilitation: (1) a decline in health and function resulting from shorter length of stay in rehabilitation, causing

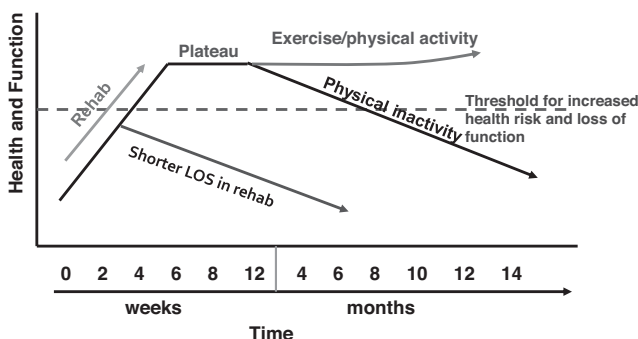


Figure 1. Conceptual model for getting beyond the plateau postrehabilitation. LOS indicates length of stay; rehab, rehabilitation. From Rimmer.²⁸

the individual to fall below the threshold (dashed line) needed to reduce the risk of health complications; (2) achievement of significant gains in health and function to exceed the threshold; and (3) exceeding the threshold and reaching a plateau in health and function, followed by a bifurcated line reflecting 2 opposing trajectories: a decline in health and function resulting from physical inactivity or the maintenance of health and function associated with regular physical activity.

Regardless of whether the individual has exceeded the threshold during rehabilitation, physical activity could provide the benefits needed to improve and/or maintain their health and functional status above this threshold and prevent postrehabilitation health decline. Thus, there is a need on behalf of the individuals exiting rehabilitation for cerebrovascular accident, TBI, or SCI for a system that enables their continued recovery in the form of community exercise. A theoretical model of such a system is proposed in the following section.

TRANSITIONAL THERAPIST-TO-TRAINER MODEL FOR PROMOTING COMMUNITY-BASED EXERCISE POSTREHABILITATION

People with neurologic disability need access to community-based fitness facilities immediately following rehabilitation to continue their recovery, reduce the risks of debilitating secondary health conditions, and optimize their health and function.²⁹⁻³⁴ The transitional *therapist-to-trainer* model from Rimmer,²⁸ illustrated in Figure 2, establishes this link between traditional rehabilitation settings such as hospitals, rehabilitation centers, long-term care facilities, and outpatient medical centers (top circle) and community-based

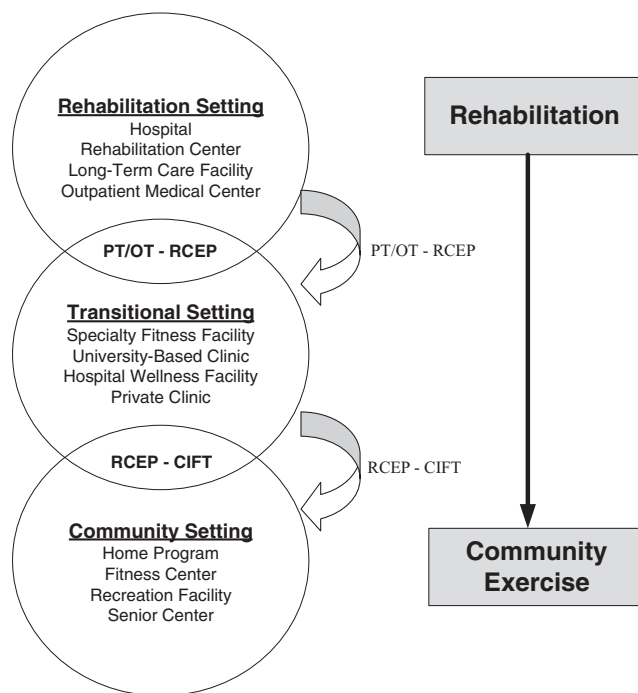


Figure 2. Transitional therapist-to-trainer model. CIFT indicates certified inclusive fitness trainer; OT, occupational therapist; PT, physical therapist; RCEP, registered clinical exercise physiologist. Modified from Rimmer.²⁸

fitness facilities, including fitness and recreation centers, senior centers, and the home (bottom circle).

Given the challenges associated with the use of fitness facilities by people with disabilities^{4,12,13,17,19} or starting an exercise program in their home, the transitional setting (middle circle) offers rehabilitation and fitness professionals the opportunity to work together in formulating an exercise plan that addresses the needs of individuals with a neurologic disability, taking into consideration what may be available in a less-structured fitness facility or the home. In the transitional setting, people with neurologic disability can be monitored closely during the early stages of an exercise program, be provided with certain types of adaptive equipment or program modifications to allow them to participate in a desired activity, and have time to adjust to the program before moving into a less-structured community-based fitness facility or home. Programs offered in the transitional setting also allow the therapist and/or qualified trainer to teach individuals how to perform various exercises, use equipment, or access various areas of a fitness facility (eg, locker room, bathroom), which is helpful in situations where an individual may feel uncomfortable about learning these skills around other members.³⁰

A *therapist-to-trainer* model fosters stronger collaborations between rehabilitation and fitness professionals to the benefit of individuals with neurologic disability who now have at their disposal the expertise of both sets of professionals.

Fitness professionals and trainers employed in less-structured community settings also play a critical role during the transitional period. The lack of knowledge on behalf of health and fitness staff has been identified as a key barrier to physical activity participation in people with disabilities.¹² To address this gap, the American College of Sports Medicine has 2 certifications related to disability—a registered clinical exercise physiologist (RCEP) and a certified inclusive fitness trainer (CIFT). A RCEP has training at the master's degree level and competency in developing exercise prescription guidelines and precautions for people with chronic disease and disability. A CIFT is an entry-level certification that provides fitness professionals who are trained at the bachelor's degree level with basic content in disability. Encouraging the pursuit of these certifications by employees can substantially increase the accessibility of a community fitness facility for someone with a neurologic disability. For example, a RCEP working with an individual with tetraplegia in a hospital wellness facility could collaborate with a CIFT to implement an exercise prescription for this individual at a local YMCA.

Beyond creating collaborations between rehabilitation and health and fitness professionals, the *therapist-to-trainer* transitional setting is also ideal for providing people who have neurologic disability with various *transformative* exercise options. For instance, a body weight–supported treadmill training program to strengthen weakened musculature on the hemiparetic side could be performed on dry land with a standard treadmill and harness or, when available, with an underwater treadmill. Strength improvement could be performed with universally designed exercise equipment (eg, swing-away seats) that is accessible to wheelchair users. An individual with SCI could increase cardiovascular en-

duration through a cycling program using functional electrical stimulation.

Home exercise programs are also viable options. One of the most promising and rapidly developing areas of health care and rehabilitation is telehealth—the use of telecommunication technologies to provide health information, assessment, monitoring, and treatment to individuals with chronic conditions from a distance.³⁵ Home-based telehealth holds promise as an effective method for conducting exercise training with hard-to-reach populations. It eliminates the barrier of transportation, offers participants the flexibility of exercising at their preferred time of day, and does not involve as much energy or time getting to an exercise facility. It is also an effective way to increase exercise self-efficacy in people with newly acquired neurologic disabilities who have concerns or fears about exercising in public fitness facilities.³⁶

BUILDING COMMUNITY-BASED INCLUSIVE FITNESS COALITIONS

While programs offered in transitional settings have enormous value in improving the health of people with neurologic disability after inpatient and outpatient rehabilitation ends, for long-term sustainable health improvements to occur, communities and their environments must provide the necessary supports (eg, transportation, trained staff, accessible information, facilities) that will allow people with neurologic disabilities opportunities to engage in community health and fitness across the life span. As can be gleaned from the *therapist-to-trainer* model, rehabilitation and health/fitness professionals need a more formal relationship to optimize the care of people with neurologic disability. A vital step in constructing this crossroad is for local fitness centers (eg, YMCAs, park districts, hospital-affiliated wellness centers, private fitness facilities) to formalize community leadership that systematically addresses the needs of people with neurologic disability.⁴

The *Inclusive Fitness Coalition* (IFC; www.incfit.org) is one entity that is working on efforts to address the fitness needs of people with disabilities. Started in 2007, the IFC is a partnership between the American College of Sports Medicine and the National Center on Health, Physical Activity and Disability (www.nchpad.org). The IFC is composed of local health professionals and organizational members that support the need for greater inclusion of people with disabilities in community-based health and fitness programs. In addition to promoting policy and environmental change, these IFCs could serve as a mechanism for physical therapists and other providers to recommend locations where patients can continue their recovery in accessible health and fitness settings and support continued collaboration between rehabilitation and fitness professionals.

LAKESHORE FOUNDATION: A MODEL INCLUSIVE COMMUNITY-BASED FITNESS FACILITY

One example of a state-of-the-art, universally designed speciality fitness facility is Lakeshore Foundation in Birmingham, Alabama. This facility has addressed numerous

barriers associated with physical activity participation by people with disabilities. This includes building structure, adaptive equipment and programs, parking and transportation, staff knowledge and expertise, and membership fees. Each of these is described below.

Facility and Transportation

All recreation, exercise, and community areas in the building are accessible. The parking lot is level and offers 3 rows of accessible spaces nearest to the building. Public transportation is also available to and from the surrounding counties. Every set of stairs has a smaller incline, and handrails are located throughout the facility. All bathrooms, locker rooms, and showers are accessible. There are 2 additional assisted and family dressing rooms located near the pool and fitness center, each equipped with a shower, lavatory, and wider benches and increased space between lockers (see Figure 3).

The aerobics room floor and the 200-meter Mondo surface track are made of softer materials to ease the impact on joints. The Aquatics Center houses a warm water therapy pool and an 8-lane 25-yard lap pool, each with zero-grade entry level, steps, ladders, and a chair lift for accessibility. The zero-grade entry allows exercisers to enter the pool by walking or wheeling down a gradual slope and eliminates the need for stairs to enter the water (see Figure 4).

Equipment

The cardiorespiratory and strength room includes a wide variety of adaptive equipment. Most of the strength equipment includes universal design features that can be used by members with and without disability. For example, some of the resistance machines have cuffs and accessible weight adjustment systems that do not require finger dexterity for proper use. There are several arm cycle ergometers and other accessible cardiovascular equipment, as well as a wheelchair accessible scale. The climbing wall uses full body or chest harnesses and all-arm routes, and the field house contains adaptive wheelchairs for soccer, rugby, basketball, and tennis, racing cycles, hand cycles, recumbent leg bikes, and tandems for visually impaired cyclists.



Figure 3. Accessible locker room. Courtesy of Lakeshore Foundation.



Figure 4. Accessible pool entry. Courtesy of Lakeshore Foundation.

Programs

More than 60 ongoing inclusive activities and classes are offered each week for children and adults with disabilities. These include classes in aquatics, fitness, competitive athletics, general recreation, and transition support. Facility support for these various activities includes 3 hardwood courts located in the field house, an outdoor tennis center, an archery and marksmanship range, a 7-meter indoor climbing wall, and a 1828 square meter fitness center.

Staff

The full- and part-time staffs are specially trained in their fields of expertise, many with advanced degrees and additional certifications related to disability. Several professionals are RCEPs, CIFTs, and Adapted Physical Activity professionals.

Membership

Economic barriers to participation are addressed by offering financial assistance in the form of full or partial membership scholarships on the basis of documented need.

Although, in most fitness facilities, it is not feasible to incorporate every aspect of inclusivity and accessibility found at Lakeshore Foundation, small changes can make a big difference. For instance, employing one certified trainer who is available to adapt exercises and guide an individual through a physical activity program could increase the accessibility

of the facility, thus contributing to bridging the gap between rehabilitation and community exercise.

EXAMPLES OF PROGRAMS FOR SELECT DISABILITY GROUPS OFFERED AT LAKESHORE FOUNDATION

New Forest T'ai Chi Group Fitness for People With Stroke

This is a unique, inclusive fitness class customized for individuals with stroke and other disabling conditions, as well as for members without disabilities. This version of Tai Chi uses slow, gentle movements that are easy to learn and ideal for people with recent stroke to improve balance and neuromuscular control. Simple, slow-motion stepping patterns are combined with arm movements that foster creativity and personal expression. The initial exercises become more complex as participants improve in strength and balance.

Aquatics for People With TBI

Aqua Range of Motion class is offered every weekday in the shallow end of the warm-water therapy pool in the Aquatics Center. The warm water can provide a relaxing, calm environment for someone with TBI. Major goals of the class are to improve strength, balance, and posture. The gravity-free environment and warm water temperature are ideal for people with TBI who have spasticity and poor balance.

Wheelchair Basketball Program for People With SCI

A wheelchair basketball program is offered for people with a lower extremity disability, including SCI. Sport wheelchairs, which provide angled side wheels and a smaller rear wheel for increased stability, are available to members. Adult and youth wheelchair basketball tournaments are held on weekends throughout the year in the 3-court field house. Open gym times allow individuals to play pickup games or practice shooting and ball handling skills. Offering opportunities for wheelchair sport, even if it begins with just a few individuals a couple of evenings a week, is an excellent way to promote physical activity in individuals with SCI.

CONCLUSION

While there is a growing body of literature in support of the health benefits of physical activity for people with disabilities,¹⁰ inactivity remains one of the hallmark features of neurologic disability. People with neurologic disability must be provided with greater opportunities to maintain a physically active lifestyle to reduce their risk of chronic and secondary health conditions.²⁷ The *therapist-to-trainer* model offers a viable option for building the crossroad between rehabilitation and community-based exercise and wellness.

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