

Innovative Approaches of Physical Therapy for Stroke Patients

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DESCRIPTION

When there is inadequate blood supply to a portion of the brain, a dangerous condition known as a stroke can happen. This frequently happens as a result of cerebral hemorrhage or a blocked artery. A steady blood supply is necessary to prevent oxygen-starvation death of brain cells in the affected location. Abrupt numbness or weakness in the arm, leg, or face, especially on one side of the body, are possible symptoms. Additional symptoms include abrupt disorientation, trouble speaking or hearing, issues with one or both eye's vision, difficulty walking, dizziness, loss of balance and lack of coordination. According to the Global Stroke Factsheet released in 2022, the lifetime risk of experiencing a stroke has increased by 50% over the last 17 years, with an estimated 1 in 4 people expected to have a stroke in their lifetime [1]. An introduction of stroke, its consequences, and innovative physical therapy techniques for managing stroke effects are given in this article.

Stroke types

According to their intensity, strokes can be divided into the following kinds:

Ischemic stroke (clots): Happens when the blood vessel that distributes blood to the brain becomes clogged 87% of all strokes are caused by it.

Hemorrhagic stroke (bleeds): When a weak blood artery bursts, a hemorrhagic stroke occurs. This disorder is usually the result of two main forms of damaged blood vessels: Aneurysms and Arteriovenous Malformations (AVMs). Hemorrhagic strokes are most often caused by uncontrolled hypertension.

Transient Ischemic Attack (TIA)

Transient Ischemic Attack (TIA) is a "warning stroke" caused by a transient thrombus.

Cryptogenic stroke: Most often, clots that obstruct blood supply to the brain result in strokes. There are scenarios in which the cause of a stroke is unknown. It's known as a cryptogenic stroke.

Brain stem stroke: A person may experience bilateral effects from a stroke that happens in the brain stem, including being "locked-in." The sufferer is usually unable to move beneath the neck or talk when they are locked in [2].

Physical therapy approaches to improve post stroke outcomes

Many functional restrictions are brought on by the stroke occurrence, including poor balance, discomfort, stiffness, weakening in the muscles, and cognitive impairment. These disabilities can have a detrimental loop of diminishing function and increasing disability when combined with a reduction in activity. Numerous physical therapy techniques have been demonstrated to be successful in addressing these post-stroke symptoms [3].

With the help of Constraint Induced Movement Therapy (CIMT), which limits the unaffected limb's range of motion to promote the use of the affected limb, neuroplasticity is promoted and functional recovery is aided [4]. Robotics Assisted Therapy (RBT) is another advanced method that helps patients achieve repetitive movements that improve strength and coordination by using robotic equipment. Virtual reality-based therapies are also gaining popularity because they provide patients with stimulating and entertaining exercises that enhance their motor skills and balance [5].

Furthermore, methods such as Functional Electrical Stimulation (FES) employ electrical currents to stimulate particular muscles, facilitating movement and retraining of the muscles [6]. Exercise in the water, or aquatic therapy, provides resistance for strengthening and lessens joint strain [7]. In addition, mirror treatment uses reflection from mirrors to provide the impression that the diseased limb is moving along with the unaffected limb. This method encourages brain reorganization and helps to improve motor performance [8].

Enhancing motor function through exercise is a vital component of stroke therapy. After a stroke, exercise has been found to increase muscle strength. Research suggests that exercises that strengthen the muscles, including lifting weights or utilizing

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elastic bands, can increase strength without making spasticity worse. But these workouts might not necessarily result in improved performance in functional tasks like walking or getting up from a chair tasks that call for both muscle strength and coordination. Functional tasks, such as repeated sit-to-stand movements, may perform better when strengthening exercises are incorporated into the routine. Repetitive task-specific workouts, such as walking on a treadmill or over ground with assistance, can be a typical method of improving gait [9].

In order to avoid heart attacks and subsequent strokes, among other secondary consequences linked to cardiovascular events, physiotherapy is essential. After a chronic stroke, the most common cause of death for survivors is still cardiovascular disease. It has been demonstrated that methods like respiratory muscle training, which includes segmental breathing, diaphragmatic breathing with lip pursing, and the use of an incentive spirometer, increase cardiac muscle strength and improve the quality of life for both heart and stroke patients [10].

The original purpose of the Fitness and Mobility Exercise (FAME) program was to assist people who had suffered a stroke. But now, some facilities are modifying it for use with elderly patients who are weak, people who have Parkinson's disease, or people who have multiple sclerosis. Although the FAME program was first designed for use in community settings, several centers have also used it in conjunction with routine one-on-one therapy and as an inpatient and outpatient group program. The FAME program helps stroke survivors become more physically and cognitively capable while lowering their chance of developing secondary problems such as fractures, falls and heart disease [11].

For stroke patients who require further training in gait and gait related activities after being released from inpatient rehabilitation and returning to the community, task oriented circuit training can safely take the role of standard physical therapy [12].

These advanced methods of physical therapy for stroke survivors demonstrate the progress made in rehabilitation procedures, which are meant to optimize functional capacities, promote healing and raise the general standard of living for stroke victims. Healthcare providers can customize treatments to match the specific needs of each patient by implementing these state-of-the-art techniques into treatment plans. This will ultimately result in better outcomes and a more efficient rehabilitation procedure.

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