



## **MUSCLE WEAKNESS AFTER STROKE: HEMIPARESIS**

Every year, more than 795,000 people suffer a stroke, a “brain attack” that occurs when blood flow to an area of the brain is stopped or severely reduced. As a result, blood and oxygen are cut off to that area of the brain, leaving damage in areas that control everything we do – including how we move different parts of our body. Hemiparesis – pronounced: Hem-i-par-e-sis.

### **What is hemiparesis?**

The word “hemiparesis” comes from the Greek: “hemi” means “one side,” and “paresis” means “weakness.” About 80% of people who have had a stroke experience weakness on one side of their bodies. Hemiparesis also can be caused by other medical conditions such as cerebral palsy, brain tumors, multiple sclerosis and other diseases of the brain or nervous system.

### **How does hemiparesis affect stroke survivors?**

Trouble moving arms and legs, difficulty walking, and loss of balance all are effects of hemiparesis. As a result, doing simple things such as grasping objects, dressing, eating, and using the bathroom can be difficult for a stroke survivor. The loss of abilities that follow a stroke depend on the area of the brain that has been affected by the stroke.

**Right-sided hemiparesis** results from injury to the left side of the brain, which also controls language and speaking. Many people who have right-sided weakness also may have problems talking and/or understanding what people say.

**Left-sided hemiparesis** involves injury to the right side of the brain, which also controls how we learn, communicate non-verbally, and behave. Damage in this area of the brain also may cause people to talk excessively, have memory problems, and have short attention spans.

Damage to the lower part of the brain, called the “brain stem,” can affect one or both sides of the body. If damage affects both sides, it may leave someone in a ‘locked-in’ state. When a person is locked-in, he generally is unable to speak or move at all below the neck.

“...gaining functional independence generally is acknowledged as the major goal of physical rehabilitation.” Dickstein, 1986

## **Treatment and Rehabilitation**

Physical rehabilitation has 2 goals: 1. Teaching stroke survivors to compensate for the lost function due to stroke; and 2. Facilitating recovery of lost function as the brain heals. Because lost function may be regained as the brain heals, it is important to start therapy as quickly as possible after a stroke. Several healthcare professionals are involved in treatment and rehabilitation:

### **Rehabilitation physician**

A rehabilitation doctor may specialize in physical medicine and rehabilitation or neurology. This doctor usually manages the stroke survivors' entire rehabilitative process.

### **Physical therapist**

A physical therapist treats medical problems or other health-related conditions that limit the ability to move and perform daily functional activities. Physical therapists focus on moving, reducing pain, restoring function, and preventing disability.

### **Occupational therapist**

An occupational therapist helps patients to participate in the things they want and need to do through the therapeutic use of everyday activities. They focus on helping stroke survivors relearn the skills needed to perform everyday activities, regain and use fine motor skills, and modify their environments to compensate for lost function.

### **Speech-language pathologist**

A speech-language pathologist helps patients when they are unable to produce sounds correctly or fluently, or has problems with their voice. They also help stroke survivors when they have trouble understanding others, or sharing thoughts, ideas, and feelings.

### **Rehabilitation Nursing**

A rehabilitation nurse provides support for patients to maintain good health while reinforcing rehabilitation techniques taught in therapy sessions. The rehabilitation nurse also helps families to gain skills to help the stroke survivors after discharge.

### **Social Worker/Case Manager**

The Case Manager works with stroke survivors and their families to plan for discharge and continued treatment after the survivors no longer need to be in the hospital. Treatment techniques that may help stroke survivors improve movement and/or use of the affected side.

They include:

- **Traditional methods** include range of motion and strengthening exercises in addition to practicing activities that stroke survivors need for their daily lives. Stroke survivors can learn to facilitate movement or compensate for their deficits.
- **Electrical stimulation** consists of placing small electrical pads on the weakened muscles of the arm or leg which, when charged, help the muscles to contract as the patient works to make them move.

- **Medications** have been used to promote muscle movement. The largest study to date involves the use of the antidepressant fluoxetine (Prozac®) over a period of 90 days. Other medications have been studied in smaller populations.
- **Mental practice (Motor Imagery)** is an experimental technique in which stroke survivors with some movement on the affected side imagine or visualize their limbs moving. This allows the brain to activate that movement as if the patient is actually doing the activity.
- **Constraint-induced movement therapy (CIMT)** involves stroke survivors practicing focused exercises using the weak arm while the good arm is constrained. Research shows that CIMT increases use and movement in the affected arm in patients who have some movement in their wrists and fingers. Researchers are studying the most effective ways to prescribe and carry out the therapy.
- **Body-weight-support treadmills** are devices that support a percentage of body weight while the stroke survivor walks. The strategy utilizes an overhead suspension system to support a percentage of the patient's body weight as the patient walks on a treadmill.
- **Virtual reality** and video gaming are experimental computer-based technologies that immerse the stroke survivor into simulated environments that promote certain types of movement. Stroke survivors then receive "real-time" feedback on their performances.
- **Robotic therapies** are experimental devices that help to train stroke survivors in movement by delivering a large number of repetitive movements. They also can assist in functional activities when the stroke survivor has impaired movement in his arm or leg.
- **Bilateral arm therapy** is an experimental technique in which tasks are performed using the non-affected and the affected hand together. It may help the two sides of the brain work better together, restoring balance and possibly improving hand function when combined with other therapy.
- **Mirror therapy** is an experimental technique in which a stroke survivor puts his weakened hand behind a mirror, and moves his strong hand. The mirror gives the illusion that movement is occurring in the hand affected by the stroke and tricks the mind and the weak hand into working better.
- **Stem cell treatments** are being researched to see how they may help the injured part of the brain to heal and thus help the stroke survivor recover functional abilities.

### **WHERE CAN I GO FOR ADDITIONAL INFORMATION?**

National Stroke Association 1-800-STROKES (800-787-6537) [www.stroke.org](http://www.stroke.org)

**National Institutes of Health** 301-496-4000 [www.nih.gov](http://www.nih.gov)

To locate an accredited rehabilitation facility (888) 281-6531 [www.carf.org](http://www.carf.org)

Research Clinical trial listing by disease or condition

[www.clinicaltrials.gov](http://www.clinicaltrials.gov)

[www.curelauncher.com](http://www.curelauncher.com)

[www.centerwatch.com](http://www.centerwatch.com)

[www.rehablab.org](http://www.rehablab.org)

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