



Understanding Weakness Post Stroke: Ask a Neuro PT



Causes

Why weakness occurs post stroke

- The brain controls movement through **motor signals**
- Damage to one side of the brain affects the **opposite side of the body**
- Loss of signal → weakness, paralysis, and coordination problems
- The nervous system can **rewire** through neuroplasticity



Defining differences

Loss of strength or movement on one side of the body

- **Hemiparesis**
 - Partial weakness
 - Movement limited, slow, or weak
 - Often improves with repetitive practice
- **Hemiplegia/hemiparalysis**
 - Severe loss of movement
 - Very little/no voluntary control
- **Flaccidity**
 - No muscle tone
 - No active movement
 - Limb feels “loose” or “heavy”



Common Recovery Timelines

The first 90 days are the most important for motor return, but return is possible at any stage

Flaccidity

- Most common **immediately after stroke**
- Many patients begin showing **some return of tone within days–weeks**
- If flaccidity persists **> 3 months**, return of movement becomes **less likely**, but not impossible

Hemiplegia

- First **1–3 months** show the **fastest gains**
- Meaningful recovery can continue for **6–12 months**
- Smaller improvements may still occur **years later** with high-repetition practice

Hemiparesis

- Often improves **earlier and faster** than hemiplegia
- Most strength gains occur in the **first 3–6 months**
- Continued progress possible long-term with **task-specific training**

Early Treatments for Post-Stroke

Often performed in hospital with therapists

Early
Mobilization

Sensory
Stimulation

Weight
Bearing

Bilateral
Training

Mirror
Therapy

Protection of
Joints

Later Treatments for Post-Stroke

Often performed in home or in outpatient settings

Task Specific
Practice

Progressive
Strengthening

Weight
Bearing

High
Repetitions

Mirror
Therapy

Protection of
Joints

Joint Protection in Chronic Hemiplegia

Prevent pain, subluxation, & long term injury

- Weak muscles and abnormal tone place **extra stress** on joints
- **Shoulder, wrist, hip, and knee** are at highest risk

Tips:

- Avoid pulling on the affected arm or shoulder
- Use stable surfaces for standing, transfers, and weight shifts
- Watch for fatigue
- Maintain proper alignment during sitting, standing, and sleeping

Supports for Long-Term Joint Protection

Prevent pain, subluxation, & long term injury

- **Shoulder supports:** brief use for pain or subluxation
- **Hand splints:** maintain alignment, prevent contractures
- **AFO (ankle-foot orthosis):** improves gait safety and reduces falls
- **Arm troughs/cushioned supports:** protect shoulder during long sitting
- **Proper footwear:** improves knee/hip alignment



Weight Bearing

Better sensory input → better muscle recruitment → stronger movement



- **Activates weak muscles** by increasing sensory input to the brain
- Improves **tone regulation** — can reduce stiffness or flaccidity
- Enhances **joint stability** (shoulder, wrist, hip, knee)
- Supports better **alignment** for walking and reaching
- Strengthens the brain–muscle connection needed for motor return

Examples:

- Standing frame
- Quadruped
- Leaning forward on table/handrail



Progressive Strengthening

For Chronic Hemiplegia

- Weakness comes from **poor brain–muscle signaling**, not muscle damage
- Strengthening improves **muscle recruitment**, **joint stability**, and **functional movement**
- Progression (changing reps, load, and complexity) drives **neuroplasticity**

Evidence supports:

- 3–4 days/week
- Slow, controlled movements
- Focus on major muscle groups: legs, core, shoulder, arm, hand
- Combine strengthening with **task-specific practice**

Progressive Strengthening

How much should I be doing?

Phase 1	Low-weight, high-repetition training	15–30 reps , light resistance	Builds endurance , improves motor control , reduces tone, supports neuroplasticity through high-volume activation
Phase 2	Moderate–high weight, low-repetition training	6–12 reps , moderate load	Builds true strength , increases joint stability , reduces compensations, improves gait and functional lifting

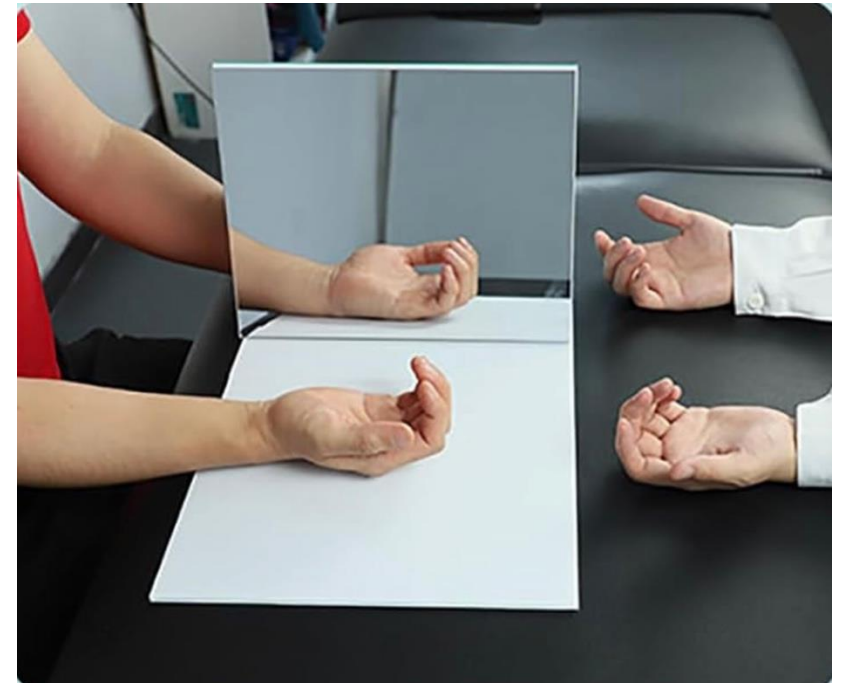
Mirror Therapy

Create Illusion of Movement

- Using a mirror to create the illusion that the affected limb is moving normally, which activates **motor cortex pathways** even when movement is limited

Why it works:

- Visual illusion activates **motor cortex**
- Boosts **sensory input** → improves proprioception
- Helps initiate movement when activation is very weak



Mirror Therapy

Create Illusion of Movement

How to Do It

- Hide the affected limb behind a mirror
- Watch the reflection of the stronger limb moving
- **Imagine your affected limb moving exactly the same way**
- **Attempt to move the affected limb**, even if nothing happens
- Perform **10–15 minutes/day**, ideally before strengthening or task practice



Task Specific Practice

Practice the exact movement you want to improve

Why It Works

- Trains the **exact brain pathway** for the task
- Improves **motor control**, timing, and coordination
- Reduces compensations and increases use of the affected side

How to Do It

- Pick **one functional task**
- Break it into **small, repeatable reps**
- Aim for **20–40 reps** of the same movement
- Keep movements **slow and aligned**

Task Specific Practice

Practice the exact movement you want to improve

Specific Patient Examples

- **Hand:** pick up a washcloth, open/close a pill bottle, grasp/release a TV remote
- **Arm:** reach to a shelf, place a cup in a cabinet, push a light door closed
- **Leg:** step taps on a stair, repeated sit-to-stands, weight shifts while holding the counter
- **Daily tasks:** fold a shirt, brush hair, carry a light grocery bag

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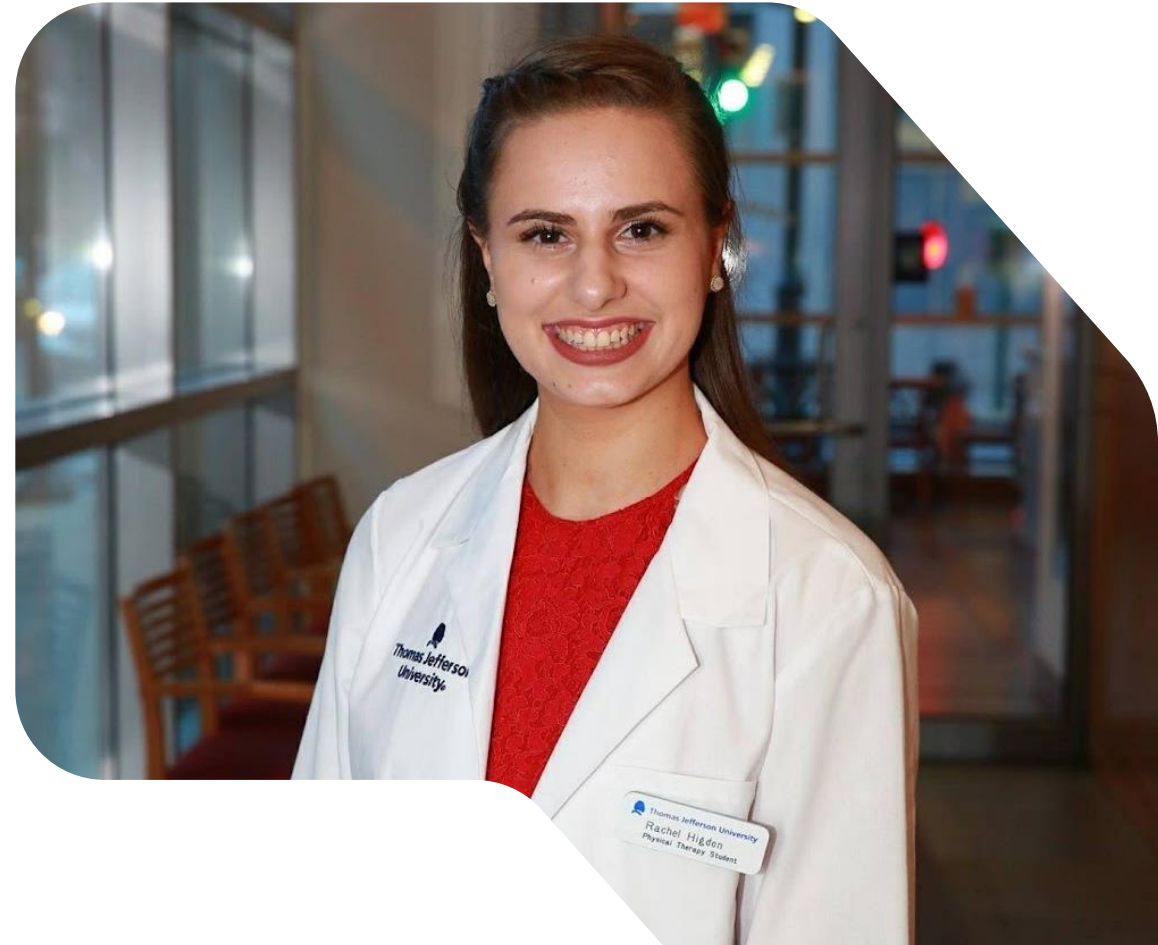
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