



## GENERAL STROKE INFORMATION

# New Therapies and Research

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### Treatments for Muscle Stiffness and Spasticity

#### **Botulin Toxin Injections**

Botulinum toxin, often known as Botox®, improves muscle stiffness and spasticity in stroke survivors. Botulinum toxin injections lessen spasticity because they block the release of acetylcholine. Acetylcholine is a chemical that nerve cells release to contract muscles. Research has found that botulinum toxin injections are safe and lessen disability in patients with muscle spasticity.

- **Use of botulinum toxin in stroke patients with severe upper limb spasticity**  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC486452/>
- **Randomized DB controlled trial of botulinum toxin A in hemiplegic shoulder pain and spasticity**  
<http://www.ncbi.nlm.nih.gov/pubmed/23064478>

### Treatments to Improve Hand and Arm Function

#### **Constraint-Induced Movement Therapy**

Constraint Induced Movement Therapy (CIMT) helps stroke survivors regain strength in their weakened hands and arms. Often, the unaffected arm (i.e., strong arm) is placed in a sling or splint to restrain movement for about two weeks. A weakened hand may be placed in a glove or mitt. The sling or mitt forces the patient to use the weak limb during exercises and daily tasks. Research has found that this therapy improves limb movement after a stroke.

- **American Stroke Association: Constraint-Induced Movement Therapy**  
[http://www.strokeassociation.org/STROKEORG/LifeAfterStroke/RegainingIndependence/PhysicalChallenges/Constraint-Induced-Movement-Therapy\\_UCM\\_309798\\_Article.jsp](http://www.strokeassociation.org/STROKEORG/LifeAfterStroke/RegainingIndependence/PhysicalChallenges/Constraint-Induced-Movement-Therapy_UCM_309798_Article.jsp)

- **Constraint-Induced Movement Therapy (CIMT): Current perspectives and future directions**  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3345246/>
- **Study to assess the effectiveness of modified constraint-induced movement therapy in stroke subjects: A randomized controlled trial**  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3724070/>

### **Electrical Stimulation**

Electric Stimulation sends a shock to the stroke survivor's weak limb. The shock forces the nerves and muscles to move. Electric stimulation is often done at a rehabilitation center. Devices for electrical stimulation can also be purchased for use at home. This therapy improves the stroke patient's chances for restoring movements to affected or weakened limbs.

- **Young stroke victim recovers with help from new electrical stimulation technology**  
<http://www.foxnews.com/health/2013/05/20/electric-stimulation-treatments-help-young-stroke-victim/>

### **Mental Practice**

Mental practice focuses on repeating a physical skill or exercise to improve limb function. Patients who do mental practice after physical therapy improve faster than patients who just relax afterwards. Added benefits may occur when mental practice is combined with constraint induced movement therapy (CIMT).

- **The impact of mental practice on stroke patients' postural balance**  
<http://www.sciencedirect.com/science/article/pii/S0022510X12003644>

### **Mirror Therapy**

This therapy is done by placing a mirror vertically in the middle of the body. It shows the reflection between the affected (weak) and unaffected (strong) side. The stroke survivor performs the same motion with both arms while watching the mirror. This makes it appear that both arms are moving normally.

- **The value of adding mirror therapy for upper limb motor recovery of subacute stroke patients: A randomized controlled trial**  
<http://www.ncbi.nlm.nih.gov/pubmed/23480975>
- **Mirror therapy for improving motor function after stroke**  
<http://www.ncbi.nlm.nih.gov/pubmed/22419334>

For more information on stroke caregiving, visit the RESCUE home page:  
<http://www.cidrr8.research.va.gov/rescue/>

## Robotic Therapy

Robotic Therapy uses machines to improve the function of a weakened limb. These machines help stroke survivors make movements easier. With practice, this therapy will improve limb movement. Robotic therapy is a new technique. Robotic therapy replaces the manual method which involved therapists helping patients to move each limb repetitively.

- **Robots to get stroke patients back on their feet**  
<http://www.sciencedaily.com/releases/2013/03/130311091309.htm>
- **Robotic therapy helps stroke patients regain function**  
<http://newsoffice.mit.edu/2010/stroke-therapy-0419>

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### Web-Based Informational Materials for Caregivers of Veterans Post-Stroke

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