CIMT
Constraint Induced Movement Therapy
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What is CIMT?

Constraint Induced Movement Therapy (CI or CIMT)- Is based on research done by Edward Taub and is a form of rehabilitation therapy that improves upper extremity function in patients suffering from a stroke or other Central Nervous System complications by increasing the use of their affected upper limb.
CIMT

- Combines constraint of the unaffected limb and intensive use of the affected limb.
- Uninvolved extremity is placed in a mitt, sling or splint
- Performing supervised structured tasks with the affected limb
- Patients learn to improve the motor ability of the more affected parts
- First rehabilitation modality to show progress and changes on how neurological injuries are studied and treated
CIMT

- **Goal**
  - purposeful movements when performing functional tasks.

- **Shaping**
  - the use of the affected limb

- **Cortical Reorganization**
  - teaches the brain to grow new neural pathways.
CIMT

Modified (CIMT) - is a short-term, intensive treatment based on overcoming learned non-use in the weaker arm/hand and improving motor skills and coordination in this arm/hand. This is achieved through placing a splint or cast on the stronger arm/hand for a three-week period while incorporating intensive motor training with other arm/hand.
CIMT

- How Does Modified CIMT Work?

- It influences the brain to develop connectivity that improves motor function. The brain changes itself when the affected extremity is involved intensive and repetitive activity.
CIMT

- Who Qualifies for Modified CIMT?

- The individual needs to have a basic grasp/release to be eligible for the program. They also need to be safe for mobility while having one hand in a cast a three-week period of at least two hours of direct, one-to-one treatment three times per week and following a HEP.
CIMT: Three Components

- Repetition, structure, intense practice of the affected arm
- Restraint of the less-affected arm
- Monitored arm use in life situations and problem solving to overcome barriers
CIMT Patients

CIMT is focused on three patient populations:

- Stroke
- Cerebral Palsy (Pediatrics)
- TBI/Spinal Cord Injuries

http://youtu.be/zwImB4U-Udo
Learned Non-use

- Result of an upper motor neuron lesion that depresses the central nervous system and motor activity after a stroke
- Use of the uninvolved extremity more often to compensate for lack of movement in the involved extremity
- Learn to NOT use the involved extremity
Qualifications for Treatment

10 x 10 x 10

- 10 degrees active wrist extension
- 10 degrees active thumb abduction
- 10 degrees active extension of any other two digits on affected hand
Protocol

- Restraint of unaffected arm for 90% of waking hours
- 2 to 3 week period, 6 to 7 hours per day of intense therapy on consecutive weekdays
- Repetitive training of more affected UE
- Behavioral agreement
- Treatment diary
Therapist Intervention

“In people with ongoing limitation of arm function after stroke, providing 6 hours of therapist-guided task practice was equivalent to 1 hour of direct therapy with 5 hours home practice over 10 days.” “Gains after two weeks of intense practice were not sustained at six months.”

Richards, L. et al., 2006
Advantages to CIMT

- Overall greater improvements in function vs. conventional treatment
- Highly researched and credible treatment approach
- Increases daily/social participation
- Decrease in medical cost over lifetime
Disadvantages to CIMT

- Requires enormous labor from both patient & medical staff
- Patient endures many hours of frustration
- Patients can suffer from muscle soreness resulting in stiffness and discomfort in the involved upper extremity as well as skin lesions and skin burns.
Disadvantages to CIMT

- Not beneficial for all stroke/B
- Typically for patients with higher level of function
- Longer treatment = higher cost to patient
- Not reimbursable through insurance
- Acute CIMT can be harmful by increasing the size of the lesion.
The Extremity Constraint Induced Therapy Evaluation Trial (EXCITE)

- Represents the first national, randomized, single-blind study to systematically test a neurorehabilitation therapy among patients with the ability to initiate extension movements at the wrist and fingers, and who experienced their first stroke within 3 to 9 months prior to enrollment.
The Extremity Constraint Induced Therapy Evaluation Trial (EXCITE)

- **Outcome Measures**
  - **Wolf Motor Function Test**
    - 15 timed tasks: sequentially from simple to complex
    - 2 strength tasks: Shoulder flexion & grip strength
  - **Motor Activity Log**
    - 11 point Quality of Movement (QOM) scale
    - 11 point Amount of Use (AOU) scale
    - Subjective, done by patient
Brain Mapping Measures

Newer Outcome Measures of CIMT

- Voxel-Based Morphometry (VBM) - is a neuroimaging analysis technique that allows investigation of focal differences in brain anatomy

- Magnetic Resonance Imaging (MRI) - radiographical imaging device portrayed by pixels.
Brain Mapping Measures
Newer Outcome Measures of CIMT

- Transcranial Magnetic Stimulation (TMS) - uses electromagnetic induction to induce weak electric currents using a rapidly changing magnetic field; this can cause activity in specific or general parts of the brain.
REFERENCES


