Neuroplasticity and Constraint Induced Movement Therapy (CIMT)

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PTA 236
In-Service Presentation
Neuroplasticity

• “The brain's ability to reorganize itself by forming new neural connections throughout life. Neuroplasticity allows the neurons (nerve cells) in the brain to compensate for injury and disease and to adjust their activities in response to new situations or to changes in their environment.” (MedicineNet.com)
Neuroplasticity (Cont.)

• The constant changing of the function, structure, and organization of neurons (nerve cells) upon exposure to new stimuli/experiences.

• “These processes are responsible for:
  – Learning
  – Formation of appropriate responses to external events
  – Recovery from brain injury

• For example: Should the right hemisphere of the brain become damaged, the left side may take over some of its functions.
Neuroplasticity (Cont.)

• “It typically isn’t until trauma or disease cause dramatic observable changes in behavior that we start to comprehend neuroplasticity.” (MCCC PTA 205)

• “The theory up until the mid-20th century was that once cellular death occurred, the only option was to facilitate with compensation.” (MCCC PTA 205)
Neuroplasticity and Physical Therapy

- Neuroplasticity is gaining popularity (science and increased focus on study) as a theory that, at least in part, explains improvements in functional outcomes with patients presenting with CVA, TBI, Cerebral Palsy, Experience Limitations, and Neural Birth Defects.

- Neuroplasticity is not limited to one particular patient population which means that it can occur in infants, children, adults, and even the geriatric population. A healthy CNS is the qualifying factor.
Treatment Interventions Utilizing Neuroplasticity

• **Constraint Induced Movement Therapy (CIMT)**
  
  – *Lets Watch!*

  – Founder Edward Taub

  – “CIPM is an innovative, research supported intervention that assists individuals in increasing the **functional** use of their hemiplegic arm. (Magee Rehabilitation)

  – Considerations/Qualifications

  – Case Study Evidence

  – Medical Insurance Reimbursement?
Treatment Interventions Utilizing Neuroplasticity

- Functional Electric Stimulation (FES)
- Virtual Reality Therapy
Treatment Interventions Utilizing Neuroplasticity

- Robot Assisted Therapy (Adolescents with CP)
  - [Lokomat](#) (click for information)
  - [Additional product info](#)
Conclusion

• Neuroplasticity was virtually “undiscovered” until mid 20th century

• Neuroplasticity (or change) occurs throughout life
  — Changes in height, weight, endurance, disease, injury)

• Neuroplasticity Treatment Interventions
  • Constraint Induced Movement Therapy (CIMT)
  • Functional Electric Stimulation (FES)
  • Virtual Reality Therapy
  • Robot Assisted Therapy
  • PNF, NDT, etc...

• Success and Acceptance
That's all Folks!
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