The Impact of Multi-Sensory Integration Therapy on Motor Recovery in the Acute Phases of Stroke Rehabilitation: A Case Report

Elizabeth D. Kerrigan, SPT; Skye Donovan, PT, PhD, OCS

Physical Therapy Department, Marymount University, Arlington, VA

### Purpose Statement
- The purpose of this case report is to demonstrate the effects of multi-sensory stimulation on motor outcomes in the acute phases of stroke rehabilitation.
- **We hypothesize** that stimulating all three sensory systems involved with balance will produce positive motor outputs and improve the prognosis for functional mobility post-stroke.

### Background
- Stroke is the fifth leading cause of death and the number one cause for disability today in the United States.
- Motor impairments affecting functional mobility skills is one of the most common issues following a stroke.
- Evidence based practice has shown the significance for sensory stimulation in order to achieve positive motor outcomes.
- **There is a gap in the literature** regarding stimulation of the vestibular system in combination with the somatosensory and visual systems.

### Methodology
- **Design of study:** Intervention
- **Equipment:** E-Stim, mirror, and camera
- **Interventions:**
  - **Vestibular** stimulation with spinning
    - The patient was spun three times in his wheelchair toward the unaffected side
  - **Visual** feedback with video recordings and mirrors so the patient could watch themselves
  - **Somatosensory** stimulation with TENS, Bioness, PNF, and over ground gait training

### Results
- **FIM:** scores improved in all categories within four weeks
  - **Transfers:** Improved from total assist x2 to mod assist x1
  - **Locomotion: Wheelchair:** Improved from total assist x1 to supervision
  - **Locomotion: Walk:** Improved from total assist x2 to total assist x1
  - **Locomotion: Stairs:** Improved from total assist x2 to max assist x1

### Discussion/Conclusion
- Stimulation to the vestibular system produced significant improvements with functional mobility in the early stages of rehabilitation.
- FIM scores are correlated with functional mobility prognosis upon discharge.
- These findings emphasize the importance of future research on incorporating vestibular stimulation into therapy.
- This study suggests that multi-sensory integration therapy is beneficial for stroke rehabilitation.