

Effects of Activities to Facilitate Neural Plasticity for a Community Client with Chronic Pain

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INTRODUCTION

Central sensitization (CS) is the amplification of neural signaling from the brain that elicits pain hypersensitivity. Prolonged sensitivity and associated pain results in cortical changes to pain processing centers in the cortex resulting in pain that is no longer purely sensory. Promoting neural plasticity can help sharpen cortical mapping and decrease perceived pain. This case highlights how factors of CS were identified in a community client with chronic pain and neurological deficits following a stroke and how interventions were provided to achieve optimal outcomes.

CASE DESCRIPTION

A 48-year-old male was being seen in a university sponsored exercise program for adults with neurological disorders and balance deficits (UW-La Crosse EXPAND program). He suffered a stroke 7 years ago and has residual neuromusculoskeletal deficits and chronic pain. Subjectively the patient reported generalized, deep pain in both feet that has been present since his stroke. He rated the pain a constant 3-4/10. His personal belief was that there was nothing that could be done for his pain. His primary goal for enrolling in the EXPAND program was to improve overall strength, balance and aerobic capacity. Standardized tests were performed to assess the client's function, results are not related to outcomes for this abstract. Due to the persistent foot pain, Right-Left Discrimination was assessed using the Recognise™ Foot app. For 40 images he presented with 10-35% accuracy on the left and 5-45% accuracy on right. Motor control/coordination of foot intrinsic muscles revealed poor activation and motor control. Based on his examination findings, an intervention plan including Right-Left Discrimination activities with the Recognise™ Foot app, Right-Left dual tasking with visual feedback, motor control activities to improve intrinsic foot activation, proprioception activities and acute high intensity aerobic exercise.

INTERVENTIONS



Right-Left Discrimination



Right-Left Dual Tasking



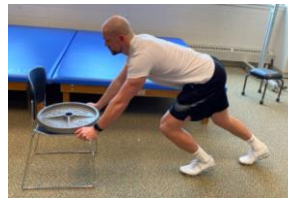
Proprioceptive Training



Foot Intrinsic Activation



Acute High-Intensity Aerobic Exercise

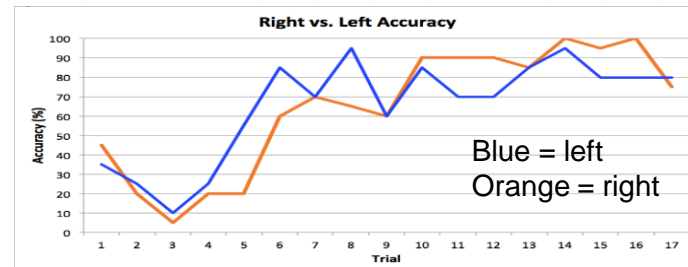
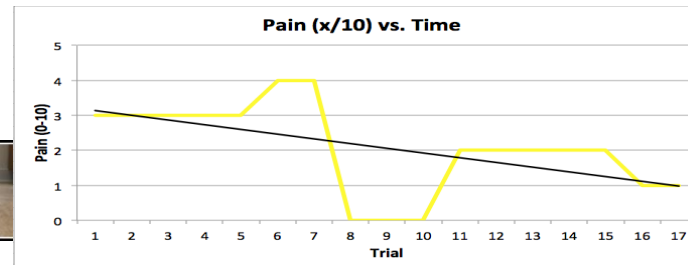


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OUTCOMES

- Right-Left Discrimination revealed 80-95% accuracy on the left and 80-100% accuracy on right for 50 images.
- Pain intensity decreased by 30% (0-1/10).
- Foot intrinsic muscle activation improved.
- Tolerance to aerobic and strengthening activity improved



DISCUSSION

Growing evidence assists the clinician to identify a clinical pattern associated with CS. Specific interventions to address neural plasticity and facilitate cortical changes have also been identified to address CS. This case highlights how recognizing the signs and matching appropriate interventions assists in clinical reasoning to improve client outcomes.