

Patty's PT Tips

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Mirror Therapy – It's More than Smoke and Mirrors

This technique was originally researched among amputee veterans who were experiencing phantom limb pain in the 1990's. Since then, it has been applied to stroke patients, complex regional pain syndrome patients, head injured patients and more recently MS patients. These studies over the past 10 years are ongoing due to positive outcomes in the early studies. The MS studies have shown statistically significant gains in:

- Decreasing fatigue
- Improving gait and balance skills
- Decreasing depression
- Increased quality of life
- Improved attention and motor control in exercises
- Increased activation of the sensorimotor network

Recent studies demonstrated better outcomes by incorporating motor imaging (mirror therapy) while observing correct motor activity by someone else on video-think of football players watching the good plays by their competitor in football or the running style of a great runner. Virtual reality equipment is one of the most recent modalities in the rehab arsenal. The researchers included music of many genres in 2/4 or 4/4 time (lots of 70's rock and roll) to help with the timing in gait. Metronomes can be used but music is more fun!

Visualization techniques (i.e the skier preparing for their race at the top of the hill) and using relaxation techniques prior to the mirror lessons have made a measurable difference. This included Jacobsen's technique (contract/relax), breath awareness, breath control or deep breathing exercises. My thought is that it makes the brain more receptive to taking in new information.

The technique is maximized if you can work with a PT or skilled athletic trainer in neurorehab who can provide verbal cues to enhance the timing and quality of your efforts. Verbal cues tap into a different aspect of sensorimotor integration-getting all your senses on board with your motor skills.

Neuromuscular electrical stimulation (NMES) that superimposes stimulation to the dorsiflexors (muscles that lift the foot) can be added to the regimen. This can be done in the clinic with the supervision of a PT or with the addition of a WalkAide stimulator or a Cionic sleeve. These devices can then be used independently if they are helpful.

Results were noted after just 5 weeks of training that showed maintenance of improved gait skills 6 months after structured therapy. Researchers think it may be beneficial to do another series of treatments every 6 months for a “tune up”. One study had patients receive clinic PT 3x/week and a home exercise program 2x/week combining mirror therapy, relaxation training and active PT. It would be useful to spend 20-25 minutes/day on the practice.

There were also studies that indicated improvement in prefrontal cortex skills (judgement) and working memory after this form of treatment. The theory is that by looking at the unaffected limb’s visual image, it helps the affected limb. The exact neural mechanisms are not clear. It may excite the motor cortex, and/or allow the visual system to send information to the affected limb which is not getting proper sensory input. Sensory or visual input is important for movement output.

A Brief summary of how to perform Mirror Therapy:

- A mirror is placed so that the person’s unaffected (stronger) limb can be easily seen
- The affected (weaker) limb is not visible and is resting comfortably
- The person looks at the stronger limb in the mirror so that it looks like it is the opposite weaker limb
- Then, the stronger limb goes through a series of movements while the person simultaneously tries to do the same exercises with the weaker limb all the while looking at the reflected image of the stronger limb.
- A closet length mirror is ideal for training the leg/foot although a bit cumbersome to hold. If you have a closet door mirror in your home, you can sit parallel to the mirror with the stronger limb reflected in the mirror. Block your view of the weaker leg with a large piece of cardboard. While looking closely at the stronger leg, attempt the movements with both feet/ankles.

Another resource for learning more about Mirror Box Therapy is on YouTube videos by David Butler, PT from Australia. He shows how to make your own box and how to use it. One for hand use can be purchased from his website: www.noigroup/product/mirror-box/ for \$50 or on Amazon for \$60-\$90.

Motor Homunculus Drawing

