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ORIGINAL RESEARCH
published: 24 March 2017
www.corticalmetrics.com

Tracking the effects of pulsed electro-magnetic field (PEMF) on individuals with a history of traumatic brain injury (TBI) with the Brain Gauge.

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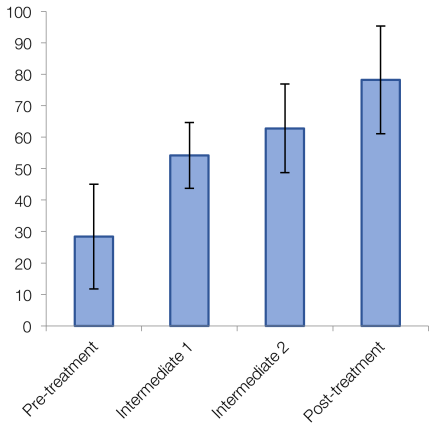
A pilot study was conducted using PEMF treatment on individuals with a history of TBI (time of traumatic insult ranged from several months to several years post-traumatic event). Individuals who had suffered mild, moderate, and severe TBI were recruited into the study, and these individuals all suffered from chronic symptoms of TBI.

A battery of tests was administered with the Brain Gauge Pro both pre-treatment and during each patient's subsequent clinical visit during the study. The bar chart below is an overview of the composite test score (combines results of all tests administered) or "cortical metric" averaged across all the individuals in the study for 3 different time points. Note the Y axis is plotted on a scale of 0-100 (% of normative range). Because the individuals responded to treatment at different rates, the times were averaged as pre-treatment (before the study started), "intermediate" (intermediate time points determined by the patient's first and last clinic visit) and "post-treatment" (final treatment point for the individual).

The overall cortical metrics score plotted demonstrates significant improvement in the patients' overall brain health that occurred while PEMF therapy was being administered. The scores paralleled other outcome measures that were obtained in the study that also demonstrated improvement in CNS function. Additionally, patients reported qualitative improvements in brain health and cognitive function over the course of the study.



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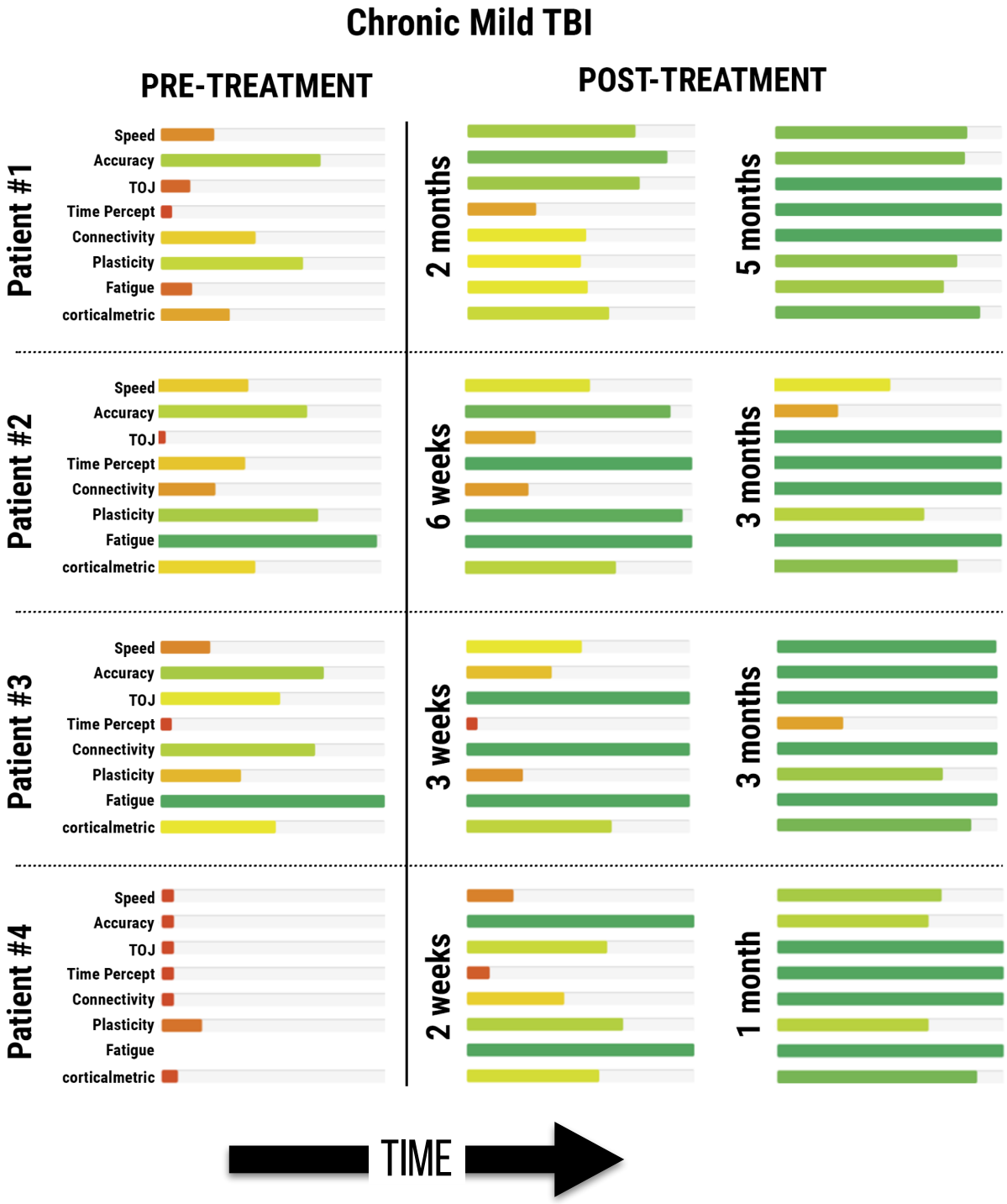
Keywords: PEMF, TBI, Brain Gauge, cortical metric

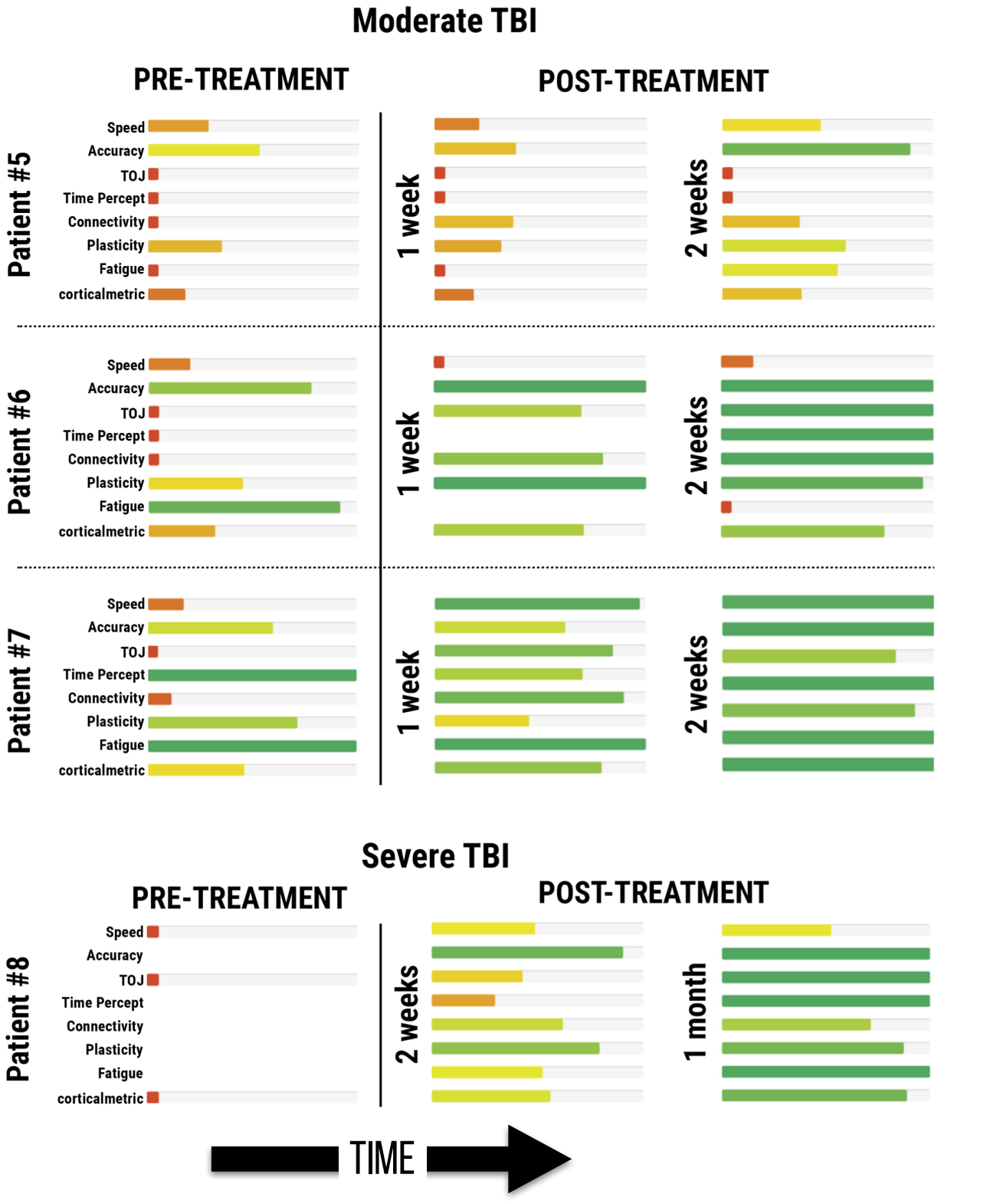
Individual data points. Data from individuals in the study is displayed in the plots below. The first 4 patients had all experienced an mTBI event but were still symptomatic (although most individuals recover from concussion, a significant per cent become chronic and have difficulty recovering).

Note that in each case, the individuals performed poorly pre-treatment and demonstrated significant improvement post-treatment (note: short red bars indicate scores that are well below the normative range; long green bars indicate scores in the normative range)



Similar observations were made for individuals who had previously suffered moderate (#s 5 – 7) and severe (#8) TBI. Chronic symptoms had lasted for several years prior to treatment.

Note that in the case of the individual who had suffered severe TBI (5 years prior to treatment), the patient could not complete the test prior to first treatment.



For more detailed reading on corticalmetrics methods and PEMF:

Mark Tommerdahl Robert G. Dennis, Eric M. Francisco, Jameson K. Holden, Richard Nguyen and Oleg V. Favorov. **Neurosensory Assessments of Concussion**, *Military Medicine*, 181, 5:45, 2016.

Eric M. Francisco, Jameson K. Holden, Richard H. Nguyen, Oleg V. Favorov and Mark Tommerdahl (2015) **Percept of the duration of a vibrotactile stimulus is altered by changing its amplitude**. *Frontiers in Systems Neuroscience* 9:77.

Nicolaas A.J. Puts, Richard A.E. Edden, Ericka L. Wodkac, Stewart H. Mostofsky and Mark Tommerdahl (2013) **A vibrotactile behavioral battery for investigating somatosensory processing in children and adults**. *J Neuroscience Methods* 218 (2013) 39-47.

Holden, J. et al. **A novel device for the study of somatosensory information processing**. *Journal of Neuroscience Methods* 204, 215–220 (2012)

Tannan, V., Dennis, R. & Tommerdahl, M. **Stimulus-dependent effects on tactile spatial acuity.** *Behavioral and Brain Functions* 1, 1–11 (2005)

Hubbard, D.K., Dennis, R.G. **Pain relief and tissue healing using PEMF therapy: a review of stimulation waveform effects.** *Asia Health Care Journal* 1(1), pp. 26-35, July 2012.

To learn more about the Reprogramed A9-5pps Model System used in this study, go to https://www.micro-pulse.com